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ORIGINAL LECTURES.

ON NEW PULMONARY MEDICAMENTS.¹

A Clinical Lecture, delivered in Cochin Hospital.

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GENTLEMEN: I shall occupy this lecture with a brief consideration of three new pulmonary medicaments: *Euphorbia pilulifera*, *terpine*, and *terpinol*.

The best antiasthmatic medication is surely that of which the basis is iodide of potassium, and when Green in 1860, Aubree in 1864, Trousseau in 1869, and, more emphatically still, Germain Sée in 1878, made known the happy effects of this remedy in the treatment of asthma, they rendered to medicine a signal service; you can, in fact, see any day in our wards cases illustrating the truth of this affirmation.

You know very well how we formulate this treatment; we begin by moderate doses of seven or eight grains and gradually increase them to thirty, forty, and even sixty grains a day. I am in the habit of ordering the iodide of potassium to be taken in milk, directing my patients at the same time to drink a great deal of milk during the day. We must, in fact, to prevent accumulation of the medicament, favor its elimination by the urine. While continuing the usage of milk, I think that the best vehicle for the administration of iodide of potassium is ale, which, in my opinion, disguises its taste better than anything else. We are in the habit, then, of ordering the patient to take at meal-time, in a tumblerful of bitter ale, a dessertspoonful or a tablespoonful of the following solution:

R.—Iodidi potassii ʒiij.
Aque ʒvj.—M.

I sometimes add to the above tincture of lobelia, in the proportion of two or three fluidrachms to the entire quantity; if, however, the lobelia causes nausea, it must be omitted from the prescription.

Despite all your precautions and all your endeavors to make the iodide palatable and well tolerated, there will be persons who cannot support it, and who cannot take it in the smallest doses without suffering many of the symptoms of iodism. Therefore succedanea to iodide of potassium have been sought for, and among these I must make special mention of *Euphorbia pilulifera*. This plant has been especially studied in our hospital service by Dr. Marsset.² *Euphorbia pilulifera* belongs to the great family of Euphorbiaceæ, which has furnished to medicine very energetic purgatives, such as croton tiglium and caper spurge; it is an herbaceous annual plant, growing in Brazil and other tropical countries,

and in Australia; the specimens which served for our clinical experiments came from Queensland, Australia.

The active principle is an acrid resin which is soluble in water and dilute alcohol. When the aqueous extract or the hydro-alcoholic extract is administered to animals, such as frogs or guinea-pigs, it is observed that in the case of frogs this extract is toxic in the dose of ten to fifteen centigrammes, which corresponds, nearly, to five grammes of the dried plant to one hundred grammes of the weight of the animal. In the guinea-pig the toxic dose is less; the animal succumbing to a dose of fifty or sixty centigrammes of the extract, equivalent to about one gramme of the dried plant per one hundred grammes of the animal's weight.

When we come to inquire into its physiological effects, we note that it acts chiefly on the respiratory apparatus, and that to a period of acceleration succeeds a period of retardation of the respiratory movements and beatings of the heart; hence, it is probable that this medicine acts directly on the respiratory and cardiac centres.

Dr. Mattheson, in 1884, was the first to call attention to the action of *euphorbia pilulifera* in the treatment of asthma, and Dr. Tison, of France, was the first to utilize this property in dyspnoeas of asthmatic and even of cardiac origin.

From a pharmaceutical point of view you may make use of the following preparations: (1) The hydro-alcoholic extract of the plant, which may be given in the dose of ten centigrammes (one and two-thirds grains) a day; (2) or the decoction, which Dr. Tison directs to be prepared by steeping half an ounce of the dried plant in two quarts of water; the dose to be three or four wineglassfuls a day. (3) I am myself in the habit of using the tincture of euphorbia, of which I give ten drops three times a day. I recommend you to cause this preparation to be taken shortly before meal-time in a cup of some aromatic infusion, such as polygala or wall pellitory. You will thus avoid the local irritant action which characterizes almost all the extracts of this spurge. (4) There exists, lastly, a syrup made by Petit, which contains five centigrammes of the extract in each tablespoonful.

In patients suffering from dyspnoea, whether resulting from simple asthma, or from pulmonary emphysema, or even a cardiac affection, euphorbia has sometimes given us good results, but it will not do to give too large doses, and of the tincture, from five to ten drops, before each of the principal meals, are enough. Notwithstanding all these precautions, you will not be able to keep up this treatment more than a week without interruption, for the patients are apt to experience a burning sensation in the stomach, which results from the local irritant action of the medicament. It is, therefore, chiefly as a succedaneum of iodide of potassium, when the latter cannot be well borne, that you will resort to *euphorbia pilulifera*.

Terpine and terpinol fulfil indications absolutely different, and are applicable in catarrhs of the lungs.

¹ Translated, from advance sheets, by E. P. Hurd, M.D., of Newburyport, Mass.

² Marsset: On *Euphorbia Pilulifera*, Therapeutic Gazette, Feb., 1885, p. 92; Thèse de Paris, 1884.

In my *Clinical Therapeutics* I have insisted on the great advantages which may be derived from copaiba in the treatment of pulmonary catarrh, but this medication can have but limited application; for, to say nothing of the repugnance which many patients have toward copaiba, and its unfortunate association in the minds of most people with gonorrhoea (which increases the prejudice against it), there are certain unpleasant physiological effects often attendant on its use, such as eructations, diarrhoea, and divers cutaneous eruptions, which militate against the usefulness of this drug.

Therefore, while recognizing how happily copaiba modifies expectoration, it is only in hospital practice that I apply this excellent medicament to the treatment of pulmonary catarrh. I believe that I have found in terpinol a very fortunate substitute for copaiba, and one which offers all the advantages of the latter, without any of its disadvantages.

When turpentine is distilled in presence of an alkali, there is obtained a special hydrocarbon having for formula $C_{10}H_{16}$; this is *terebinthene*, which undergoes hydration, and thereupon furnishes a white, solid, crystalline body, which is the *bihydrate of terebinthene*, or *terpine*. This terpine, in presence of an acid, such as sulphuric or hydrochloric, is transformed into an oily body, to which has been given the name of *terpinol*.

Terpine was employed for the first time in therapeutics by Prof. Lepine, of Lyons, and, as a result of experiments on man and animals, he found that this body might be with advantage substituted for turpentine, and that it acted as expectorant and diuretic; his dose of terpine is twenty to sixty centigrammes (three to ten grains). We have reproduced in our service the trials of Prof. Lepine, and our pupil Dr. Guelpa has interested himself particularly in this undertaking. Terpine presents a real inconvenience in its slight solubility, requiring, as it does, 200 parts of cold water to dissolve one part of this substance; therefore, it is necessary to have recourse to alcohol in order to obtain active solutions; which is a drawback when one desires to prescribe it for diuretic purposes.

We have given terpine in much larger doses than M. Lepine; we have administered one, two, and even three grammes a day without obtaining any well-marked diuretic effect; so, in accordance with Tanret's suggestion, we have substituted terpinol for terpine.

Terpinol is an oily liquid body, which gives forth a very strong odor of tuberose (*polianthes tuberosæ*), and especially of gardenia (cape jasmine). Adrian has made for me capsules with terpinol, each containing ten centigrammes (one and two-thirds grains), and we give our patients six, eight, ten, and even twelve of these capsules a day. Terpinol may also be given in pill form, and here we give Tanret's formula, which can hardly be improved upon: Take of terpinol, benzoate of soda, of each, ten centigrammes (one and two-thirds grains), sugar, q. s. for one pill. These pills contain the same quantity of terpinol as the capsules.

We have made several experiments on animals, and have noted: 1. The rapid elimination by the respiratory passages of terpinol, which long imparts its special odor to the breath; 2. Its feeble elimination by the urine, which also gives forth the odor of terpinol, though much less markedly than the breath.

We then made trials of terpinol in two orders of com-

plaints, pulmonary catarrh and affections of the urinary passages. As might have been foreseen, it was in pulmonary catarrh that we obtained the best results, since it is chiefly by the pulmonary surface that terpinol is eliminated. The sputa become more fluid, their bad odor disappears, and expectoration is facilitated. In affections of the urinary organs, the results have been almost nil. As a diuretic and modifier of the urine, it has shown itself very much inferior to turpentine.

So that if we were to attempt to classify these three substances, turpentine, terpine, and terpinol, according to their therapeutic effects, we should say that for the catarrhal affections of the bronchi, terpinol deserves the first place, and turpentine the last, while in the case of catarrh of the urinary organs, the order is exactly the reverse. This completes what I have to say at present on the subject of new pulmonary medications and antiseptic medication.

ORIGINAL ARTICLES.

PHYSIOLOGICAL STUDIES OF THE KNEE-JERK, AND OF THE REACTIONS OF MUSCLES UNDER MECHANICAL AND OTHER EXCITANTS.

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(Concluded from page 173.)

Faradic electricity. A moderate current (short circuit, poles four to five inches apart), sufficient to move muscles, without pain, was used on the thigh, feet, arm, or hand, with the result of increasing k.-j. A current violent enough to give rise to pain and muscle-cramp sensations, or the abrupt use of a wire-brush on dry skin increased the k.-j. powerfully. The latter experiment—*i. e.*, the application of the wire-brush—produced almost as marked an effect on the k.-j. as anything that we tried, and left the skin so sensitive that a light touch at once increased k.-j.

Galvanism. This gave far more interesting results. Ten or twelve cells of an active zinc and copper battery caused slight but distinct burning sensations when placed on the skin three inches apart. Thus used anywhere on the leg struck, the opposite limb, the arms, hands, back, or flanks, they increased the k.-j., or, when they did not, the addition of five or six cells insured this result. In these short circuits the direction of the current seemed of no moment; but it was of importance to make and break the circuit to get the most marked result. This was effected by applying the two poles at once to the skin.

Galvanism to head, back, etc. The startling results obtained by the coincident use of knee-tap and currents through the head appear to open new paths of investigation. A great number of these experiments have been made by the authors, with the aid of Drs. J. M. Taylor, S. C. Wood, T. R. Neilson, W. J. Taylor, and G. Hinsdale. As they involved the passing of powerful currents through the brain,

every neurologist will understand the risks and the discomforts to the physicians who subjected themselves to these experiments. We may add, that persons are sometimes met with who feel very little vertigo or distress from powerful currents through the head, and who yet give good reactions as regards the influence these currents exert on the k.-j.

It will be, of course, needless to state all of our observations; of necessity, there were many failures, and the whole investigation should lead to laboratory study on animals, from which more accurate and more clearly explanatory results may be looked for. Their influence on the therapeutics of electricity seems also to be promising.

The subject being placed at rest on a lounge, with one leg on the crutch-rest, or held up in a loop, one pole of an open circuit of twelve cells is placed on each temple. An assistant has on the floor an apparatus enabling him to change the direction of the current, and to make or break circuit abruptly. A second assistant taps the tendon at intervals of three or four seconds. The assistant who controls the current watches his chance, and, without notice, makes and breaks circuit. Under these circumstances making circuit causes, of course, subjective sensation of light, some muscle movement of the temporals and occipito-frontalis, and more or less vertigo (fifteen cells or fewer), with notable increase of k.-j. This experiment always succeeds, but, in some subjects, a larger number of cells must be used. The effect wears out after a few repetitions. Breaking circuit causes little or no increase of k.-j.

The same experiments were made with the poles over the leg centres, or with one on the temple and one behind either ear, or with both behind the ears; but although the latter caused most vertigo, and all gave increase of k.-j., none gave as remarkable a result as when the two temples were within the circuit. This may perhaps be due to the thinness of the temporal bones or may await some more satisfactory physiological explanation.

Polar effects of galvanic current. To test this, the subject, as before, was placed on the lounge and the positive pole was held on the temple, while the negative was placed on some indifferent spot, on the clavicle or on the hand. With ten cells, but little sensation was produced at the positive pole, and on making and breaking the circuit no effect was produced on the k.-j. When a greater number of cells were used, the sensations of burning and pricking became much more marked under the positive pole, and the k.-j. was reinforced. On moving this pole about the temple certain regions were found which gave more scalp pain than others, and making the current at these points gave the most reinforcement to the k.-j.

A very different result was found to follow the placing of the negative pole on the temple. In this case a marked increase of k.-j. was seen, even with currents that gave no results with the poles reversed, and when thirty or thirty-five cells were used the effect was proportionally greater.

The sensations experienced were entirely different with the two poles; the first gave the most scalp pain, while the second gave an indescribable sensa-

tion within the head. These results were obtained whether the tendon on the same side or on the other was struck. Not so marked a result was obtained when the positive or negative pole was placed over the leg centres, as on the temple.

The effect of galvanism to the head is so decisive that it is difficult to explain it as being merely the result of a combination of influences, and yet it may be that it is so active because it affects at one and the same time, taste, sight, and general sensibility, and also gives rise to motion.

Galvanism and muscular effort combined. The same observations were made with the addition of violent and abrupt muscular effort. In this case as passivity is needless, the subject himself makes circuit either with the free foot or hand, while he strongly closes both hands. Of course, he watches the fall of the hammer, or, in case of constant excitations by frequent knee-taps, may neglect to do so. In either case coincidence of patellar blow, making circuit, and muscular effort gives the largest amount of increase of k.-j. in any way obtainable.

As to the next observation, it must be said that it is often difficult. It succeeds best with a fresh man in the morning, and has been made on the ignorant and unprepared as well as on ourselves. It succeeds to-day and fails to-morrow. In one instance it failed with four persons at nine P.M. of a warm, moist relaxing day, having succeeded before and since with at least two of them. As it demands the most powerful current a man can bear, it is needless to say that we hesitated to repeat it often. Indeed, in one or two cases, headache and vertigo, lasting an hour or two, followed it.

With the individual seated or supine (thirty to seventy cells) current through temples. Violent synchronous closure of both hands. Knee-tap. Very great increase.

Same conditions. A blow on the *tibia alone*, quite below the tendon, coincident with making current, caused distinct k.-j. Then the leg was steadied by a hand on the calf, to prevent swing, and the same phenomenon was seen. Next the muscles in front of the leg were tapped sharply, and a k.-j. obtained. These effects were absolute, and were verified over and over. They can be had only three or four times, and then not again for some time.

It seems clear that a combination of strong galvanization of the brain with violent voluntary action is capable of making the muscles as sensitive as they sometimes are in disease, and that under these circumstances we get response to such milder forms of stimulation as a tap on the tibia.

The most probable explanation of this remarkable phenomenon is that it is due to the imperceptible stretching of the quadriceps muscle by the blow on the tibia. In cases of spastic paralysis where it is obtainable with the greatest ease by the slightest percussion of the tibia without the aid of combined muscular movements elsewhere, or electricity through the head, if an assistant slowly extends the leg while the operator steadily taps the tibia, the k.-j. is not observable unless the blows are delivered with a considerable increase of force, because the forward

movement of the leg neutralizes the influence of the backward impetus given by the blow; a blow forward on the internal border of the shaft of the tibia does not produce the k.-j. This experiment could not be verified on a healthy subject, as this form of k.-j., the product of voluntary motion and galvanism, is slight and disappears so soon. The observation shows, however, how enormously the k.-j. is increased by the combined influences mentioned.

The "front tap contraction" described by Gowers, may also be explained in the same manner. To elicit this symptom the foot is pressed up until the calf muscles are tense, the leg being extended on the thigh with the calf resting on the operator's knee; a tap is now delivered upon the anterior group of muscles, or on the tibia, an imperceptible pull is thus made on the tendo Achillis as the result of the slight downward movement of the leg which is followed by an answering jerk of the calf muscles.

This phenomenon has heretofore only been observed in disease, but we have succeeded perfectly in producing it in health, by the conjoint use of galvanism through the head and violent voluntary movements of the arms, and also by the latter conjoined with the electric wire brush. We attempted to produce an ankle clonus in the same manner, but failed.

Galvanic currents to head with sensory stimulation to skin elsewhere. The use of head currents with pinching or freezing of the skin gave a larger addition to the k.-j. than did either alone.

Galvanism to spine. With subject at rest in a reclining chair, or lying on his side on a lounge, or seated, one pole was placed on the first cervical vertebra, and the other on the last lumbar; descending current thirty to seventy cells, caused moderate increase of coincident k.-j.

Ascending current gave great increase of k.-j. The best results were had with interruptions which were not very abrupt. As there are pain, flash, taste in the mouth, both here and in the case of the head muscle movements, it is difficult to be sure as to the mode in which the current acts; certainly neither direction of current lessens the jerk, and the phenomenon of increased k.-j. seems to have relation rather to the making than to the rupture of the galvanic circle. It were also as well to add that the effect of these long circuits demands for its full expression subjects of unusual sensitiveness. It frequently fails entirely. Continuous moderate currents up or down the spine do not add to k.-j.

The time element. In these experiments it soon became evident that in order to obtain the best effects, and occasionally to obtain any at all, a certain relation in time must be observed between the muscular act, or making of the circuit, and the tapping of the tendon. In the foregoing pages the expression, coincident tendon tap, is often used, and the method of completing the circuit was by a pedal or by an electric button which was pressed by the thumb, and coincided with the tendon tap as nearly as was possible with such a coarse movement. In order to make the circuit practically coincident, an electric hammer was made, so that the lightest tap with this upon the ten-

don sufficed to close the circuit. In repeating the experiments with this, it was found that double the number of cells could be borne, through the head or up and down the spine, as the circuit was very abruptly made and broken, and the interesting point is, that with this we failed to reinforce the k.-j. It therefore seems that the muscular action, or circuit-closing, must precede the tap, in order to reinforce it, by a period which is, as yet, undetermined, and which needs for its determination careful work in the laboratory. When a series of very quick taps, ten or twelve per second, on a tendon were employed, thus constantly exciting the muscle, it was possible at times for the subject to appreciate the interval mentioned. When the experiment of increasing the k.-j. by the application of the secondary current and the wire brush before mentioned was employed, a large portion of a second elapsed between the application of the brush to the forearm, and the reinforcement of the k.-j. This was perfectly patent to all observers, and particularly so to the subject experimented upon. It is also entirely clear, that the effect of volitional reinforcement lasts some little time, certainly in some people quite a second.

Skin reflexes. These being unquestioned reflexes, it became desirable to know if they obeyed the laws of reinforcement. Among them the cremaster reflex is the most available, and, as regards this, we think it clear that it is not increased by distant muscular acts, nor by sensations, as of pain.

Direct muscle reactions. In examining the k.-j. we were naturally led on to a remarkable series of discoveries in regard to the behavior of muscles when mechanically stimulated by a blow. The capacity of the muscle to respond to a blow varies with the muscle and the subject. It will, we think, be found that in health those persons give the best muscular response in whom the k.-j. is best. In some men a painful blow is needed to move the muscle; in others, the least tap of the hammer calls out motion. Usually the rounded conical end of our rubber percussion hammer gets the best response; but whatever is used, we make a local depression in the muscle as we strike and stretch the fibres abruptly over a limited area. What we thus do has some resemblance to the universal pull on the muscle fibres made by a blow on a tendon, but the direct muscular blow is far more rough and violent, and is a coarser and more local stimulation. The stretched muscles contract as the hammer leaves the part.

Relation to voluntary motion elsewhere. Place the bare, prone arm of a sensitive young person at rest on a cushion, with the hand dependent; strike the muscles on the back of the arm or the long supinator, so as just to get motion of the hand or of the muscle without the hand; then cause the subject to flex the other hand strongly: the muscle reaction will be at once reinforced notably. If we repeat this experiment by striking the extensors of the leg, and use violent effort in closing both hands, we shall get, in good subjects, a distinct k.-j.

All the motions which reinforce k.-j. can be shown to increase the mechanically evolved muscular reaction.

To swallow, cough, laugh, count aloud, or strongly

act with the limbs, hands, or feet, reinforces the effect of a tap on the muscle. Even the slight act of winking decisively is competent to do this.

Tension behaves somewhat as it does with the tendon-jerk. With the muscle in full relaxation we get fair results. With slight passive tension the blow acts better, and over a larger area, for obvious mechanical reasons. With extreme tension we utterly fail to be able to cause movement.

Effect of one direct muscle reaction on another. As one k.-j. does not increase another, so neither does one muscular reaction from a direct blow increase another produced at the same time; neither does the k.-j. increase the direct muscular reaction, nor *vice versa*.

Sensation and galvanism. Rhigolene freezing and remote or near sensations (pain) reinforce direct muscle reactions (m.-j.), but not nearly so well as they do the muscle reactions from a blow on the tendon (k.-j.). Galvanism through the head increases the direct muscle act as it does the k.-j.

Points of resemblance between the direct muscle acts (muscle-jerk) and the knee-jerk.

These phenomena have many points in common, the differences are chiefly of degree, and are partly due to the fact that in the k.-j. we have a whole muscle in movement and in the muscle-jerk but a small fraction of it.

The knee-jerk seems to depend for its existence on the presence of muscular tone due to the connection of the muscle with the spinal cord, while the direct muscle reaction depends upon the presence of the muscular irritability which exists independently of any immediate connection with the spinal cord, but may be increased by toning influences coming from it.

The tap on the tendon is a distinct generalized sharp pull on the whole muscle, and is a somewhat delicate excitation easily affected by neural changes. The direct muscle blow is a strong, positive local stimulus. It may be left in existence after the knee-jerk is lessened or lost by disease. Usually what increases the one adds to the other, as we see in spastic palsy. In a case examined lately, a young man in absolute health, without a trace of disease, athletic and a good dancer, there is absolutely no knee-jerk and also no muscle act under hammer in the thigh, neither can these be called into action by any coincident act, electricity, rhigolene, etc., although in the arms the muscle-jerk is perfect for all tests.

It seems difficult to escape the conclusion that the two sets of phenomena are but varied forms of expression of one normal muscular property, dependent for its integrity upon various nutritive conditions, and for its grades of excitability upon certain relations of the muscle to normal spinal centres.

Inability to reinforce electrical contractions of muscles by the means which add to knee-jerk and muscle-jerk. It was natural to presume that if k.-j., and the muscle response to a tap, could be increased by remote movements, and sensations, and galvanism, that electricity, the third means of exciting motion, would follow the same law. This is not so; no form or degree of muscular movement obtained through galvanism or faradism could be increased by anything we could do; heat, cold, galvanism to head

with volitional movements, all alike failed. It is hardly needful to detail these observations; they were varied, and made on several persons in whom it was easy to get the reinforcement of k.-j. by volitional acts or pain. The cause of this exception is not clear. It seemed possible that electric currents might interfere with the passage of the more delicate tone waves. This we tested as follows: a strong or moderate faradic primary current being allowed to traverse the supinator longus, the muscle was struck lightly with the flat end of a percussion hammer, so as to get a slight direct response; then, violent contraction of the other hand was still found able to reinforce the muscle-jerk. There are obvious fallacies in this too promising experiment, for it is impossible to be sure that all of the muscle is, so to speak, electrically occupied, unless we use an excessive current, and that interferes with the experiment, by causing too much contraction. There is, however, an interesting observation which anyone may easily repeat, and which gives one a distinct impression that electrical possession of a muscle makes its volitional acts fatiguing or difficult. Let the arm rest on a cushion, prone, faradize the extensors, so as to contract them only partially, now will to extend the hand; there is at once felt to be some unusual need for effort, some mysterious impediment. It takes an extra effort of will to use the muscle through which runs a faradic current.

It may be, therefore, that nerve and muscle texture, when under the coarse influence of electric stimulation, are less accessible to gentler tone waves.

Reinforcement of volitional acts by other volitions. If muscular movement, caused by a blow or a tap on a tendon, be capable of increase by willed motion in another part of the body, it seemed to us that one act of will should thus increase the effects of another act of will. This has been stated to be the case by Quetelet,¹ and denied by G. Stanley Hall and E. M. Hartwell.² Our own experiments incline us to believe with Quetelet. Muscles already fatigued by previous efforts seemed to show the most reinforcement. We hope to investigate this subject further.

Résumé and conclusions. The k.-j. varies in health, it may be exhausted by too much use, and may increase from frequent excitation.

All volitional acts, if strong enough, may increase the k.-j. of either leg, and even such small acts as winking, etc., are competent to do so under favoring circumstances.

Weak innervation of the crural nerve increases, and strong innervation of the same, prohibits k.-j.

All sciatic innervation increases k.-j.

Volitional reinforcement lasts for an appreciable time after volition ceases.

Continued violent muscular acts, as of both arms and hands, at last enfeeble the k.-j., and this enfeeblement lasts for an appreciable time.

Passive tension is not essential for the production of k.-j.

Moderate tension mechanically favors it.

Extreme tension destroys it, even in spastic cases,

¹ Sur l'homme et le développement de ses facultés, par A. Quetelet, Bruxelles, 1836, vol. ii. pp. 79, 80.

² Bilateral Asymmetry of Function, Mind, No. xxxiii.

and this is probably mechanical in part, but also, and to a large degree, physiological.

An act of will directed to a part which is functionally inert, or to amputated parts, reinforces k.-j. Hence it is not the muscular motion which is the essential factor.

Strong or weak stimulation of one sciatic in an etherized animal, intensifies the k.-j. of the other leg; pressure upon the sciatic in man, causing pain and numbness, diminishes the k.-j. of that leg.

Elbow-, ankle-, and jaw-jerks obey the same laws as the k.-j.

One k.-j. does not reinforce the other.

Mere touch has no effect on k.-j. All abrupt impressions, as of pain, heat or cold, anywhere on the skin, increase k.-j.

Gustation has no effect on k.-j.

Violent optical impressions, in sensitive cases, increase k.-j.

Nitrite of amyl has no effect on k.-j.

Etherization, if profound, abolishes the k.-j. in dogs, has less effect in rabbits.

All short faradic currents, anywhere, if strong enough to move muscles, increase k.-j.

The wire-brush, with faradism on the dry skin, is one of the most effectual of all means of addition to k.-j.

Short galvanic currents, not strong enough to move muscles, give, under certain conditions, marked increase of k.-j.

Galvanism to temples especially, but also to other regions of the head, gives large reinforcements to k.-j.

Making circuit is more effectual than breaking, and these effects soon wear out.

The negative pole to temple gives greater and more constant increase of k.-j. than the positive in same position.

There is more effect on k.-j. from pole on temple than over leg-centres. Effect the same for either k.-j.

Galvanism to temples, with violent synchronous muscle acts, very greatly reinforces k.-j.

Long ascending spinal galvanic currents give good increase of k.-j.; descending, far less.

Moderate constant currents to spine do not reinforce k.-j.

The skin-reflexes (cremaster, abdominal) are not reinforced by muscle acts or by pain.

When the belly of a muscle is struck, the resulting contraction obeys all the laws of reinforcement which apply to the k.-j. Tension has upon it much the same influence as on k.-j. One muscle-jerk does not reinforce another.

The movement caused by electricity seems incapable of reinforcement.

Tension lessens the effect of even quite strong faradic currents as to pain and motion.

Well-known facts and the researches here stated, lead us to believe that the knee-jerk and other like responses to tendon taps are direct muscular acts; they cannot exist without that spinal contribution known as tone, which is capable of increase from a variety of causes. These muscle responses to a pull on the tendon cannot be reflexes, for the latter are

inhibited by violent sensory stimulations, which are here shown to increase the k.-j. The true skin-reflexes are incapable of being reinforced by distant volitional muscular acts like the k.-j., and have a time far greater than that of the k.-j. The two groups of muscular replies to forms of irritation, therefore, differ radically. There is no reason to believe that the aid given by moderate tension to the knee-, ankle-, elbow-, and jaw-jerks, is other than mechanical; besides, it is not essential. As regards the k.-j., tension has previously been shown to be unessential. The jaw-jerk can be had when the part is without tension and is being supported by the hand. A tap on a tendon mechanically affects the tissues lying within the whole of the muscle case, but whether through the nerve ends, or more directly, is difficult to say.

The tendon tap is a more delicate mode of stimulating the muscle to act than is the mechanical blow upon its body, it is also more competent to influence the entire muscle.

The direct blow on a muscle is abrupt, violent, and local, and has two results. By abruptly depressing the muscle it makes on the muscle fibres a pull, which is limited, and to which they respond by contractions, and at the spot directly hit the immediate violence of the blow has the effect of causing an abrupt mounding of the fibres, which rise rather slowly as the longer primary fibrillar contraction ceases. This small firm elevation is not easily observed in firm muscles or in health, except in thin subjects or over bones; it lasts for some seconds and slowly disappears.

It is seen from these researches that the muscle responds to various excitations by virtue of its intrinsic irritability and its tone. Both of these vary, and their sum, when the health is highest and the body at its best, represents capacity to shorten under nerve influence, and other less natural excitations. The muscular irritability depends for its character and existence on nutritive influences. The tone is merely what might not inaptly be called tuning of the muscle. It is a final preparation for volitional excitation. We have already said that efferent spina excitations sustain its constancy, and from our own observations it seems clear that incessantly tone waves are flowing from the spine, set in motion by every sensation, and by all muscular volitions however remote.

Hence it is that when by section of nerves, disease, or other cause, we cut off the efferent influences, tone is lost and the most delicate of muscle tests, the response to tendon taps, is synchronously abolished. Clearly something in the muscle itself is the most potent excitor of tone waves, as is shown by the fact that section of the sensitive roots so affects them as to put an end to the k.-j.

After cutting the crural nerve, although tone is lost, the muscle still competently replies to the violent excitation of a blow in the peculiar manner described. If now the animal be killed, circulation ceases, and with this nutritive damage come lessened responses to a blow and greater humping up of the fibres at the point struck. This latter phenomenon seems to increase for a time as the muscle gets weaker, and

are thus reminded of the fact that in the feeble muscles of thin, phthisical people it shows so remarkably well.

Next the long contraction from a direct blow becomes less, and soon only the shorter is seen. Then this too is lost. At this stage of enfeeblement, induction currents still powerfully affect the fibres which all other excitants fail to impress.

The application of the facts we have discovered to clinical research remains to be made, but assuredly they widen the field of useful possibilities in the domain of symptomatology.

It is very difficult to explain the fact that electricity, sensory impressions, and distant voluntary muscle acts increase the knee-jerk and the response to the muscle blow. If we conceive of a series of inhibitory centres extending from the mesocephalon all the way down the cord, and infer that all the agents mentioned are capable, by more or less paralyzing these centres, of releasing the active reflex groups below them, we shall be able to comprehend that the centres thus set free may, by increasing tone, give to the muscle a suddenly enlarged capacity to respond to the tendon taps or the muscle blow.

Nearly all of the facts with which we are concerned may be explained by inhibition organs and the effects produced upon them. On the other hand, it is equally conceivable that whenever a sensation reaches the cord or brain, or both, an overflow may occur which shall, by increasing the excitation of the centres, be felt throughout the body and reinforce any organs chancing to be synchronously otherwise excited from without. Under this view we conceive of the nervous force as not confined entirely to the direct paths between the centres and the muscle to be moved, but as overflowing so as to pass through numerous ganglia, adding a certain small increment to their effects when in a state of such activity as the spinal toning centres must be at all times. The tone centres thus stimulated send out a higher wave of excitability to all the muscles, and if at the time this reaches a muscle that muscle is being excited by a tap, there is an increased response.

Several facts tend to support this theory of overflow. The awkward movements of young children, and the associated movements accompanying many of our everyday acts which require great effort, may be thus explained. In excitable conditions of the spinal cord associated movements are common. Writer's and telegrapher's cramp are examples in point.

Lauder Brunton's theory of the coincidence and interference of nerve waves, as increasing or diminishing the resulting motions, as waves of light and sound are known to be influenced, may in the light of further knowledge be competent to explain more precisely the manner in which overflow acts as a reinforcing agency.

Our discoveries as to the various influences which affect the direct and indirect muscle reactions should, we think, be regarded as distinct additions to physiological knowledge. The brief speculations founded upon them may be more or less correct, and until we have examined their relations to the domain of pathology it will be difficult to decide more positively on their causes.

PERFORATIVE ULCERATION OF THE CÆCUM;

FORMATION OF FECAL ABSCESS, COMMUNICATING THROUGH THE FEMORAL SHEATH WITH THE THIGH; OBLITERATION OF THE ABSCESS CAVITY; RECOVERY.

BY GEORGE T. MCKEOUGH, M.D., M.R.C.S. ENG.,
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THE following brief history of a case of typhlo-enteritis I have thought of sufficient interest for publication, not only on account of its happy and rare, if not unique, termination, but as presenting unusual symptoms throughout its evolution.

F. B., aged 47, French Canadian, blacksmith by trade. He has a good family record; both his father and mother are still living. There is no history of tuberculosis or other hereditary disease in his family. He has had several attacks of intermittent fever at different periods of his life, otherwise has always had exceptionally good health. He is married, and the father of fourteen children, seven of whom died in infancy, three of supposed tuberculosis; a daughter has had "sore eyes" for several years, and another has just recovered from a large abscess of the thigh.

His late illness began Saturday, August 9th. He had been feeling as well as usual during the day, ate a hearty breakfast and dinner, but had no desire for supper, and had a "bad taste in his mouth," for which he took a dose of "salts and senna" at bedtime. During the night he was very ill, vomited frequently, and was thoroughly purged. The following day he felt very unwell, suffered from headache, nausea, and occasional vomiting, and sent for a physician, who informed him he had a bilious attack with fever. The ensuing day he travelled 300 miles; was very weak, but there was no other marked symptom. He consulted me Aug. 12th, complaining of muscular weakness, languor, headache, pains in his back and limbs, and failure of appetite. The tongue was coated; pulse 80, and temperature 99.6° F. There was no complaint of abdominal symptoms, nor had there been any epistaxis. He was ordered a quinine mixture, to remain quietly at home, and to restrict himself to a milk and water diet.

Two days subsequently (Aug. 14th) I visited him, and found symptoms had not improved; suffered from severe frontal headache, general weakness, malaise, and some soreness over his bowels, which were slightly tympanitic; pulse 89, temp. 101° F. He was ordered to bed and the quinine continued, my diagnosis wavering between typhoid and remittent malarial fever.

Aug. 16.—P. M., temp. 102° F., pulse 80. He has a dull abdominal expression, sunken cheeks, intellect somewhat clouded, breath foul, resembling the peculiar, heavy, offensive breath of typhoid patients; still complains of headache, but its severity has abated; slight soreness in the abdomen, and some pain in the region of his right hip, but its precise locality he is unable clearly to define. His bowels are open, but there is no tendency to diarrhoea. There is neither tremor nor rose-colored rash to be seen.

20th.—During the past few days his temperature has varied from 100° to 101° F. in the morning, to

102 to 103° F. in the evening; his pulse has never exceeded 90 per minute. The headache has ceased, but he has complained of great pain in the upper part of his right thigh, the pain being most severe along the line of Poupart's ligament. Pressure increases the pain, and the tenderness seems greatest at the point where the femoral sheath emerges from under the ligament. There is some abdominal tympanites and a fulness which is uniformly distributed, but no hardness or tenderness on pressure in any part of the abdomen. After careful palpation I thought increased resistance was slightly more marked in the right inguinal region than in the left. The right thigh is flexed, as is usual in typhlitis, and complete extension cannot be endured. Movements of the entire limb in the flexed position, within a limited area, do not augment his sufferings, nor does a rap on the heel increase the pain. The manipulations were undertaken to detect or eliminate any joint affection, the cause of the pain being obscure. He reclines upon the painful side, and any attempt to move him from this position causes unbearable suffering. Opium had to be administered freely, hot fomentations were first applied, afterward a few small blisters to the painful parts. Quinine and dilute nitro-muriatic acid were also given. The opium did not cause constipation.

26th.—The pain and tenderness are subsiding, opium not being now required, but the thigh, especially the upper third, has enlarged to nearly double the dimensions of the left limb; to a less degree, the lower two-thirds has also increased in size; but below the knee there is no swelling. There is neither redness, nor any palpable indication of an abscess pointing; deep pressure along the course of the femoral vessels in Scarpa's triangle is painful; he still keeps the thigh flexed, and lies partially upon the right side.

For a day or two past he has had a diarrhœa with ochre-colored dejections, which he regards as brought on by drinking heartily of beef-tea, the diarrhœa ceasing on a return to milk diet. This occurrence revived, in my mind, the idea of typhoid fever; it having been pointed out by Brieger,¹ that the typhoid bacilli when cultivated in a peptone solution produce no poison, but when cultivated in an infusion of meat, induce its decomposition, with the production of two poisonous alkaloids, both of which cause diarrhœa. This probably accounts for the clinical fact that beef-tea and its congeners are so frequently inadmissible in typhoid fever, developing diarrhœa when that symptom does not exist, or increasing such a condition if it be present. With this exception, there was no pronounced disturbance at any time of the function of the alimentary canal. There are none of the ordinary symptoms of typhlitis or perityphlitis present, such as fulness, tenderness, pain, hardness, or the presence of a tumor in the cæcal region. His temperature varies from 100° F. A.M. to 102° F. P.M., pulse 80. There are neither chills, sweats, rash, tremor, nor are there sordes upon the teeth.

Sept. 6.—The swelling is gradually subsiding,

and tenderness likewise, although there is a feeling of fulness along the course of the femoral vessels in the upper part of the thigh, and severe pressure causes pain. Cannot fully extend his thigh as yet, but lies on either side. No desire for food. Temperature still elevated.

12th.—I had not seen the patient for several days until to-day, when on examining his leg in conjunction with Dr. T. K. Holmes, a tumor the size of a small orange was seen about the junction of the upper middle third of the thigh on its inner and anterior aspect. The lump fluctuated, was tympanitic, and pressure caused it to subside with a gurgling similar to that heard in the reduction of a hernia. Allowing the limb to hang down or pressure upon the abdomen caused its reappearance, while alternate pressure upon the tumor and abdomen produced loud gurgling sounds. The air could be clearly felt passing to and fro. Upon elevating the limb and using gentle pressure, the tumor almost entirely disappeared, leaving, however, a few hard irregular masses about the size of acorns; some small, diffused, ill-defined masses could also be felt in Scarpa's triangle. Temperature 100° F. Pulse about 100. The diagnosis was now definite: there was evidently a perforating ulcer of the cæcum, doubtless situated in its posterior wall, which, according to Bartholow,¹ is the most common position for its occurrence; out of fourteen cases analyzed by him, in twelve the accident occurred in that portion of the gut not covered by peritoneum. A fecal abscess was the result, the contents of which must have followed the course of the iliac and femoral vessels passing down between the peritoneum and iliac fascia, beneath Poupart's ligament, being confined probably to the sheath of the vessels until the resistance became so great as to cause pointing toward the surface. Inquiry was made as to the possibility of the patient having swallowed any foreign body previous to his illness, but the result was negative.

Pads of absorbent cotton were placed about the upper anterior and inner portion of the thigh, extra pads being laid along the course of the vessels, and a flannel bandage applied from the foot upward to the thigh and abdomen, pressure being firm but equable. To remain in bed with leg elevated, and the strictest quiet to be maintained. Milk or butter-milk for diet, and a mixture containing nitro-muriatic acid and tinct. calumbæ was given.

18th.—He is gaining strength, suffers no pain, sleeps well, appetite improving, bowels open daily, and he is in good spirits. In reapplying the bandage, faint gurgling sounds were heard when the bandage reached the upper fourth of the thigh.

Oct. 1.—His temperature has been normal for the past few days, his appetite is good, and he is renewing strength daily. He was permitted to leave his bed to-day, and to use crutches. Not the slightest gurgling was heard in applying the bandage to-day, the small hard masses had disappeared, but a decided thickening could be felt along the inner side of the femoral vessels, for about an inch and a half below Poupart's ligament.

¹ Practitioner, August, 1885.

¹ American Journal of the Medical Sciences, October, 1866.

17th.—The bandage was omitted to-day; the thickening near the upper part of the femoral sheath was found to have disappeared; the right limb is greatly emaciated, and out of all proportion to the remainder of the body.

He gradually gained strength, used crutches for two or three weeks on account of the feebleness of the right leg, and for some weeks after discarding his crutches he favored this leg, limping slightly when walking. He was seen November 28th, and seemed quite recovered, and almost as strong as ever, having returned to his trade. The termination of this case was certainly a fortunate one, and, I think, may be in part attributed to the absolute rest maintained throughout the course of the disease, and to the avoidance of purgatives, two essential factors which cannot be too rigorously attended to in the treatment of all obscure abdominal affections of an acute character.

NOTES OF THIRTEEN CASES OF TUBERCULAR MENINGITIS.¹

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ALL of the cases were observed in private practice, hence the lack of detail of symptoms, such as temperature, etc. They occurred in a period of six years. Nine of them were in the writer's private practice, two in institutions under his care, and two in the practice of medical friends. It may be considered a disease of frequent occurrence, and is more commonly met with than many other diseases of recognized frequency, as, for instance, forms of liver disease. The nine cases occurred in a practice ranging from 50 to 400 families yearly, during the six years. For every case of tubercular meningitis, the writer has had twenty-five of phthisis. During the same period one case each of tubercular peritonitis and intestinal tuberculosis have been under his care. In later years the disease has been less frequently seen, corresponding with the social improvement of the practice. In the first half, six cases were observed. In the latter half, the remaining ones. The mortality table of the "Homes" to which the writer has been physician, present some interesting features in this connection. In one Home of 180 boys, aged from three to sixteen, and 30 adults, but three cases of tubercular meningitis occurred in five years. In a Home for 24 colored children of both sexes, mean age seven years, the disease was not observed in four years. In a third Home for children of both sexes, about eighty in number, in the records of twelve years, no death occurred from this disease. During the same period of observation of these nine cases, five cases of hydrocephaloid disease, one of cerebro-spinal meningitis, and two of syphilitic meningitis were observed.

Causes: Seven of the cases were males, and six females, showing that sex exercises no causal influence. The ages ranged from seven months to fourteen years in twelve cases. One was thirty-two. Six of the patients were under five years, four between five and ten, and two between ten and fifteen. The ances-

tors of nine had tuberculosis in some form. In two other instances the children of the same generation had some tubercular affection. In only two cases was there no antecedent or coincident history of tuberculosis in the family. One of the patients, aged seven months, was nursed by a mother whose tubercular disease antedated her pregnancy.

The hygienic surroundings in the large number of cases were quite fair. Two alone could be pronounced bad. One child had been weaned early in life, and improperly fed afterward. The previous health of all save one or two was bad. Some remote local inflammatory foci, either of simple or specific nature, could be determined. In one, aged fifteen months, the bronchial and mesenteric glands, after a whooping-cough and diarrhoea, were diseased; asthma and bronchitis, with enlarged bronchial glands, no doubt, preceded in another; hip-joint disease, suppurating cervical lymphatics, chronic bronchitis, and phthisis, respectively, preceded in four cases. Very poor health in one instance, and "weak" lungs in another, also preceded. In one, the health had apparently been good; in two the state of the health was not noted. Exposure to the sun was thought to be the cause of the twelfth, but the lad was always fragile, and had diarrhoeas. The nursing baby completes the list—she was always delicate.

Clinical Course: In general, it may be said to be irregular. In six cases the periods of invasion, excitation, and depression could be traced. In two instances the stage of invasion or the premonitory symptoms was absent entirely. In the other cases the stages were "mixed."

The following summary indicates the mode of development of the entire series. Case I. was a girl aged sixteen months; antecedent cause, whooping-cough and tabes mesenterica, slight general spasm, followed in a few hours by convulsion of right side of body with aphasia. In Case II., boy aged four, with asthma, etc., there was loss of flesh for four weeks, intermitting headache ten days, vertigo three days, was peevish and restless at night. Case III., girl aged ten years, had for one year headache and vertigo, with extreme emaciation (cerebellar tumor). In Case IV. there were loss of flesh, debility, restlessness and poor appetite for several weeks. The course of the fifth was not known, while the sixth had been ill ten days definitely; for some time loss of flesh with pain in the left temple, sleeplessness and constipation being present. Sharp paroxysmal headache tormented the seventh case, a youth of nine, for three days prior to the meningitic explosion. Until twenty-four hours before very active symptoms occurred, the eighth case, an infant under two years, was considered in perfect health. Prolonged lassitude, fretfulness, and some emaciation, preceded the illness of Case IX., a boy of eight. For four weeks the tenth case, a precocious little girl five years old, suffered from symptoms not unlike malaria—languor, emaciation, fretfulness, irregular intermitting fever, restlessness at night, poor appetite, without vomiting or constipation. The eleventh case had phthisis, but observed that his customary hectic had quitted him two weeks before the development of headache and vertigo, which symptoms antedated the active brain symptoms

¹ Read before the Philadelphia Neurological Society, January 25, 1886.

by four days. The twelfth case did not thrive as a nursing baby should, and vomited frequently. A convulsion was the first warning of cerebral trouble. The thirteenth case, a little girl, lost appetite, was peevish, slept poorly, was feverish and became emaciated for three weeks before the cerebral symptoms developed. She had lymphatic enlargement in the neck and abdomen. Emaciation, debility, fretfulness, night-restlessness, irregular febrile movement, disorders of the gastro-intestinal tract and headache were, therefore, the chief premonitory symptoms in these cases, emaciation being the most frequent and most marked.

An analysis of the phenomena of the first and second stages would be tedious and without practical value. Reference in the succeeding notes will be made to some salient groups of symptoms, present more or less in both stages, and to peculiar manifestations of common symptoms. *Headache, motor and sensory irritations, and palsies* occurred in all the cases. In a few, the *headache* was distinctly intermittent. The *spasms and palsies* of groups of muscles were irregular in respective cases, as to order or frequency. Hourly change in the state of the muscles was common, and the same may be said regarding sensation. Not only does this apply to alterations of function of spinal but also of peripheral nerves. Convulsions (partial, unilateral, or general), delirium, and coma were present, but presented no peculiar feature.

Special senses: Total blindness was early in one case; impairment of vision in five; optic neuritis was recorded in three. The state of the pupils was not of special import—in one instance there was irregularity in size in the second stage. In the first stage they were not affected, save contracted in one instance, and fixed, in a dilated state, in another. Dilatation was the rule in the second stage. Nystagmus was observed in one case. Purulent conjunctivitis occurred in eight cases, in the second stage usually, and in two instances was unilateral. Ptosis was present in only one case.

In five instances local erythema and general flushings were noted. An urticaria-like rash was seen in three instances. In the later stages pallor or a bluish hue of the face was observed. A unilateral mottling of the extremities was observed. Emaciation was marked and persistent in the prolonged cases, nine in all. Fever was present in the first stage in seven cases; in the second, in nine; intermittent in type, often with irregular paroxysms. Hyperpyrexia was noted in one. The *pulse* was slow seven times in the first stage; irregular or intermittent in four. In the second stage it was usually quickened, small, rapid and feeble; twice, slow and irregular. It was never wiry or corded in either stage.

Vomiting occurred but three times in the first stage; once only in the premonitory stage, and once only in the final stage. Constipation was seldom observed—three times in the first, twice in the second stage. Diarrhoea was excessive once. Offensiveness of the *breath* was very frequent and occurred chiefly in the last stage, but was so marked at first, in three cases, as to be noted. In nine instances the tongue was heavily coated. The sca-

phoid abdomen occurred at varying periods: once in the first stage, seven times in the second stage, while three times it is recorded absent; twice there is no record. Respiratory symptoms: first stage, irregular or Cheyne Stokes, four times, rapid twice, slow once. Second stage, Cheyne-Stokes twice, rapid six times.

Remissions of a decided character were noted twice; after the development of the most grave symptoms, a period of improvement led to hopes of recovery.

Duration: Of premonitory symptoms, unknown twice; prolonged, once; one year (cerebral tumor), once; in three cases, about four weeks; in two, ten days; in one, three days; in another, twenty-four hours; and in two the first stage developed at once.

First stage: Twelve hours, 2; four days, 2; five days, 2; ten days, 2; eleven days, 1; thirteen days, 1; unknown, 3.

Second stage: Twenty-four hours, 1; seven days, 1; five days, 3; forty-eight hours, 1; six days, 1; eight days, 1; four days, 2; nine days, 1; unknown, 2.

Entire duration: Thirty-six hours, 1; four days, 1; seven days, 1; twelve days, 2; fifteen days, 2; eight days, 1; fourteen days, 1; eleven days, 1; unknown, 3.

The difficulty of estimating the duration is evident to any one. It can only be said that a short first stage, in all the instances, determined a short second stage.

A post-mortem examination was held in four of the cases. In two the disease was largely localized, once in the cerebellar region, again over the right frontal convolutions, the presence of the tubercle causing during the life of each the symptoms due to localized cerebral irritation at these points.

Summary. From the above we learn that *tubercular meningitis* may be considered a disease (1) of frequent occurrence, in the middle and lower classes especially; (2) more frequent than other localizations of tuberculosis, except the pulmonary; (3) and much more frequent than other varieties of meningitis.

That the *predisposing causes* are *age*, and a hereditary tendency to tuberculosis. That the *exciting cause* is a focus of infection, inflammatory or "cheesy," which can almost always be found in some part of the body.

That the premonitory symptoms of note are emaciation, fretfulness, gastro-intestinal disorders, irregular fever, and headache. That the symptoms of the fully developed disease, worthy of note, aside from headache, spasms, and palsies, are purulent conjunctivitis; erythema, and other vascular changes of the skin; an offensive breath; the scaphoid abdomen; irregular fever and alterations in pulse and respiratory rhythm. Vomiting and constipation were not marked phenomena in the cases of the series. The expression of the face and the decubitus of the patient did not differ from the usual accounts. That the premonitory symptoms may be absent entirely or of very variable duration.

That the symptoms of the first stage continue six days (average); of the second stage, four and one-half days (average); and the entire duration lasts on an average ten days.

We have learned further, from the above observa-

tions, that the diagnosis can be made by attention to the following points. The age; the hereditary tendency; the presence of a caseating focus or the history of a disease likely to produce such a focus; the presence, in addition to cerebral symptoms, of two or more groups of the symptoms detailed in the preceding summary, and the appearances of the eye-ground.

We are aware that these conclusions differ, in many respects, from those presented in the text-books. They are deduced from the above series, and are believed to be substantially correct. It is to be regretted that no light can be thrown on the interesting relations of the tubercle bacillus. These studies were made before its discovery, however.

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MEDICAL PROGRESS.

THE SOUND ACCOMPANYING THE SINGLE CONTRACTION OF A SKELETAL MUSCLE.—DRS. HERROUN and YEO have made a series of experiments on this subject. The sound heard on auscultating a continuously contracting skeletal muscle is generally ascribed to certain vibrations of the active tissue, of such periodicity as to give rise to a tone of some thirty-six to forty waves per second. The theory that the normal muscle sound might be said to have a relationship to a musical tone has been always used as an important link in the evidence tending to prove that normal nerve impulse is intermittent, and that continuous voluntary contraction is composed of summated single contractions, like the artificial tetanus produced by interrupted stimulations. The fact that the heart beat is but a single contraction is commonly urged against the view that the systolic sound is due to muscular tone, because it is commonly accepted that the sound produced by contracting skeletal muscles depends upon the regular variations of tension of the tetanic contraction. Their conclusions were as follows: 1. That a single contraction of a skeletal or heart muscle gives rise to motions or vibrations which evoke the resonant tone of the membrana tympani. 2. That the tone heard in voluntary contraction is no evidence of distinct or regular vibrations in the muscle, but merely of motions, regular or irregular, which produce the vibration of the membrana tympani. 3. That the tone heard in voluntary contraction is, therefore, no evidence of regular discontinuity of natural nerve impulses, but simply depends upon trembling movement due to variations either of force or distribution of stimulation. 4. That the objection to the first heart-sound being a muscular sound, because the systole of the heart is a single contraction, is not valid, since the single contraction of a muscle causes motions or vibrations which call forth the resonant tone of the ear.—*Journal of Nervous and Mental Disease*, Jan. 1886.

RESORCIN IN GONORRHOEA.—LETZEL finds that three per cent. solutions of resorcin are sometimes irritant to the urethra, and recommends that the treatment be begun with a two and a half per cent. solution, and increased according to the tolerance. In chronic gonorrhoea four per cent. solutions are usually borne without trouble. The average duration of treatment, in acute cases, was about twelve days; in chronic cases fourteen

to thirty-two days. Stress is laid upon the necessity of employing chemically pure snow-white resorcin, which is entirely colorless in solution. It is dissolved in distilled water, kept well corked in opaque glass bottles, and it is recommended that not more than three ounces of the solution be ordered in one prescription.—*Centralb. f. d. med. Wiss.*, Dec. 19, 1885.

RATIO OF INCREASE OF HEIGHT TO INCREASE OF BULK IN THE CHILD.—Some remarkable observations have been recently made by the Rev. Malling Hansen, principal of the Danish Institution for the Deaf and Dumb, on the progressive increase in height and weight of children, 130 of whom were under his charge. Of these, seventy-two were boys and fifty-eight girls, and they were weighed in batches of twenty, four times daily: in the morning, before dinner, after dinner, and at bedtime. Each child was measured once a day. The weighings and measurements extended over a period of three years, and the results showed that the increase in the bulk and height of the body does not proceed at a uniform rate throughout the year. Three distinct periods, with some minor variations, were observed. In regard to bulk, the maximum period extends from August until December; the period of equipoise lasts from December until about the middle of April, and then follows the minimum period until August. In regard to height, the maximum period corresponds to the minimum period of increase in bulk. In September and October a child grows only a fifth of what it did in June and July. So it appears that during the autumn and the beginning of winter the child accumulates bulk, but the height is stationary. In the early summer, on the other hand, the bulk remains nearly unchanged, but the vital force and nourishment are expended to the benefit of height. When the body works for bulk there is rest for growth, and *vice versa*. M. Hansen has observed a similar ratio of increase of bulk to increase of height in trees. In regard to the minor variations observed, it is probable that they are dependent—in part, at least—upon the external temperature, so that when this runs up there is marked increase in weight, whilst a diminution of weight occurs with a fall of temperature. M. Hansen's observations were communicated to the International Medical Conference, held in Copenhagen in 1884, and are undoubtedly of considerable importance. Similar observations have been made both by Dr. Percy Boulton (whose results were given in our columns in 1880) and by Dr. W. R. Miller, surgeon to the West Riding Convict Prison. Dr. Miller experimented on about 4000 prisoners for thirteen years, and obtained results that differ sensibly from those of M. Hansen; for he found that the season of maximum increase in weight in adults is from April to August, and the period of minimum increase in adults from September to March. Dr. Miller found the body became heavier in summer and lighter in winter, and he attributes the loss of weight to the more active excretion of carbonic acid gas in the colder months.—*Lancet*, Jan. 23, 1886.

THE SYNTHESIS OF COCAINE AND ITS HOMOLOGUES.—By treating anhydrous ecgonin with benzoic oxide and methyl-iodide for ten hours to 100° in a sealed tube, MERCK has produced cocaine. Substituting ethyl-

iodide, the same reaction gave him its ethyl homologue, which crystallizes from alcohol in brilliant prisms fusing at 108° – 109° . Platinum chloride produces, even in very dilute solutions of its salts, a yellow precipitate soluble in hot water and crystallizing on cooling in brilliant yellow rhombic plates. Ladenburg proposes for it the name rhocethyline.—*American Journal of Science*, Feb. 1886.

TOBACCO AMBLYOPIA.—In a tabulated report on twenty cases of tobacco amblyopia, DR. G. HARTRIDGE presents the following methods of diagnosis and treatment: The chief points relied on in the diagnosis were: (a) Rapid failure of sight, with no ophthalmoscopic or other change to account for the great loss of vision; (b) central color scotoma; (c) excessive smoking. Of the twenty cases, all improved considerably, and in thirteen complete recovery may be said to have resulted. In one instance the patient was a woman (the only one that has ever come under his notice suffering from tobacco amblyopia), another was a teetotaler, and four chewed as well as smoked; but in no instance has he met with a case of amblyopia in a person who used tobacco for chewing only.

As regards treatment, the essential point was the total discontinuance of smoking, instead of diminishing the quantity and quality of the tobacco, as suggested by some writers. In half the cases strychnine was administered, in the other half a placebo, with apparently equally good results. Galvanism was tried in three cases, but with no appreciable effect. After recovery, three or four pipes of mild tobacco daily were allowed, but a caution was given that excessive smoking would be likely to produce a return of the amblyopia. In his experience optic atrophy has never resulted.—*Brit. Med. Journal*, Jan. 30, 1886.

HIPPURATE OF SODIUM.—DR. BON, in applying GARROD'S observations, that sodic hippurate has the property of decomposing uric acid, has recommended the following formulæ for use in affections dependent upon the uric acid diathesis:

| | |
|--------------------------------|-----------|
| 1.—Hippurate of sodium | 10 parts. |
| Carbonate of lithia | 3 " |
| Glycerin | 30 " |
| Cinnamon water | 500 " |

Dose, f ʒiv, four times daily.

| | |
|--------------------------------|-----------|
| 2.—Hippurate of sodium | 12 parts. |
| Chlorate of potassium | 3 " |
| Simple syrup | 40 " |
| Peppermint water | 400 " |

Dose, f ʒiv, four to six times daily.—*Les Nouveaux Remèdes*, Jan. 1, 1886.

THE MENTAL CONDITION IN HYPNOTISM.—In the work by DR. D. HACK TUKE, on "Sleep-walking and Hypnotism," he brings together very much that is interesting. He touches slightly on the injurious effects of hypnotism upon the subject. It is to be regretted that this matter, which is an exceedingly practical one, has not received more attention, either at the hands of the author or others.

He sums up the chief points relative to the mental conditions present in hypnotism as follows:

1. There may be consciousness during the state of

hypnotism, and it may pass rapidly or slowly into complete unconsciousness, as in the somnambulistic state; the manifestations not being dependent upon the presence or absence of consciousness, which is merely an epiphenomenon.

2. Voluntary control over thought and action is suspended.

3. The reflex action, therefore, of the cerebral cortex to suggestions from without, so long as any chance of communication is open, comes into play.

4. While consciousness is retained, the perception of reflex or automatic cerebral action conveys the impression that there are two egos.

5. Some of the mental functions, as memory and imagination, may be exalted, and there may be vivid hallucinations and delusions which may persist after waking.

6. Unconscious reflex mimicry may be the only mental phenomenon present, the subject copying minutely every thing said or done by the person with whom he is *en rapport*.

7. Impressions from without may be blocked at different points in the encephalon according to the areas affected and the completeness with which they are hypnotized; these are impressive or suggestive whether by gesture or word or muscular stimulus, may take the round of the basal ganglion only, or may pass to the cortex, and having reached the cortex, may excite reaction and reflex muscular action with or without consciousness, and wholly independent of the will.

8. There may be, in different states of hypnotism, the opposite conditions of exaltation and depression of sensation and the special senses.—*Journal of Nervous and Mental Disease*, Jan. 1886.

ILIAC ABSCESS OPENING IN THE INTESTINAL CAVITY.

—DR. GARRIGA Y PUYG, of Madrid, relates the case of a child, about two years old, in whose right buttock was a painful tumor, resulting from a fall, about one month previously. A purulent diarrhoea confirmed the diagnosis of a pelvic abscess opening in the intestinal cavity. The perforation was evidently quite small, for the tumor constantly increased in size. In a few days manifest fluctuation appeared immediately behind and below the great trochanter, the incision of which caused the exit of a large quantity of fetid pus, mixed with gas of a stercoraceous odor. The cavity was washed out with a solution containing one per cent. of carbolic acid and five per cent. of alcohol, thrice daily. The fistula closed after one month of this treatment, and the recovery was complete.—*Gazette Hebdomadaire*, December 19, 1885.

INFLUENCE OF PREGNANCY ON THE PROGRESS OF MENTAL DISEASES.—The lately recorded personal observations of PERRETI accord with the generally accepted conclusions that the appearance of pregnancy in the course of a mental disease usually exercises an unfavorable influence.

If the prognosis is not thereby rendered fatal, it is at least rendered more grave and doubtful; and the more so, the later the appearance of the pregnancy in the course of the malady. Patients in the state of dementia are not notably influenced by the physiological accident in question, though usually a period of superexcitation appears, after parturition, which last is usually normal.—*L'Encéphale*, Dec. 1885.

THE MEDICAL NEWS.

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SATURDAY, FEBRUARY 20, 1886.

OPERATION TO RESTORE NERVE FUNCTION.

IN THE MEDICAL NEWS of December 19, 1885, attention was called to a remarkable case of successful nerve-section, by Surmay, after excision of a piece three-quarters of an inch long. In this case, while the result was astonishing and better than had ever been obtained before, it was possible to bring the divided portions of the nerve into immediate contact; and it is the rapidity with which the function was restored which excites comment, and not the mere fact that it was restored. But there is another class of cases of nerve injury, in which so much tissue has been lost or injured that the gap can only be filled up by some method less simple than suturing. How to deal with these cases has long been a puzzling question to surgeons. In a recent paper, "Ueber die operative Behandlung von Substanzverlusten an peripheren Nerven," contributed to the *Archiv für klinische Chirurgie*, Bd. xxxii. Heft 4, TILLMANN'S, of Leipzig, presents a very interesting review of what has been done, experimentally and practically, in this way, and gives an account of a case of his own in which the best results followed the employment of a method which he recommends.

The operations which have thus far been suggested may be summed up as follows:

1. Transplantation of a piece of nerve from an animal of the same or of another species. This has been done successfully in animals by Philipeaux and Vulpian, and others, and most recently by Gluck. But the result is uncertain, and the conditions favorable to success are not yet clearly defined, although this plan certainly invites further study and experiment. It has once been employed in man by P.

Vogt, and once by Albert, with apparently negative results.

2. Nerve-grafting, as proposed by Létievant in 1863. This method consists in uniting the peripheral end of a divided nerve to the continuity of a sound one in a way indicated by its name. It has been employed once in the human subject by Desprès, the result being good, but, as Tillmanns points out, open to the suspicion that it may have depended more upon vicarious action of unimpaired parts than upon restoration of lost function in the nerves and muscles previously affected.

3. A modification of this method consists in joining a nerve divided at a lower point to the continuity of one severed higher up, and then uniting the distal end of the latter to the proximal end of the former, while the proximal end of the second nerve is joined to the continuity of the one divided at a lower point. This complicated method appears never to have been practised either upon man or upon animals.

4. Vanlair, in 1882, reported that he had secured regeneration of a nerve in dogs by securing the divided extremities in the ends of a decalcified bone drainage tube. Here the tube seems to have served simply as a protection to the developing nerve fibres as they proceeded from the proximal end.

5. Löbker, in one case, resected a piece of both bones of the forearm, and sutured the soft parts, including the median and ulnar nerves, with an excellent result.

6. Létievant, in 1872, attempted to unite the divided median and ulnar nerves of a man by cutting down on them, dissecting up from each end of both a pedunculated flap, and joining the flaps by sutures, so as to fill up the gaps in the nerves. This operation did not improve the condition of the patient. Nevertheless, Tillmanns is convinced that it is worthy of imitation, and has employed it in a single case, which he reports in the paper before us. His patient was a woman, twenty-three years old, who had been wounded with a scythe about two inches above the wrist, on the volar side of the forearm, with complete division of the median and ulnar nerves, followed by paralysis and atrophy of the muscles to which these nerves are distributed. Four months after the date of the injury, Tillmanns cut down through the scar, and found the ends of the nerves separated by a gap about an inch and three-quarters wide. He freshened the ends, dissected up a flap from each of them, and joined these flaps with two fine catgut sutures. A similar method was used to join the ends of the divided tendons. The wound healed by first intention. Passive exercise and electricity were energetically employed, and the functions of the nerves and muscles were almost fully reestablished in the course of fourteen weeks. The patient's condition a year after the operation was so

good, that she wrote Dr. Tillmanns a letter with the previously paralyzed hand, which she said was as good as the other, except that sensibility was not perfect at the ends of the second and third fingers.

It is not surprising that such a result should lead Tillmanns to recommend this method of operating to others. To this motive may also be added the inducement offered by a knowledge of the mechanism of nerve regeneration. This is not so exact as might be wished; but it seems probable that nerves are regenerated by the outgrowth of tissue which proceeds from the proximal end of a divided trunk, and that any interposed material can only serve as a sort of scaffolding or guide for the advance of this tissue. It would appear rational, therefore, to use for this purpose an absolutely homologous material, as well as one which is vitally connected with the part to be renewed. It would certainly appear advisable to try this flap method in cases in which the ends of a divided nerve cannot be brought together, before resorting to so radical a procedure as cutting out a piece of bone to permit of their approximation, as was done by Löbker. But, in any case, the facts briefly indicated above, together with the well-known power of regeneration in nerves, are calculated to encourage surgical interference in cases in which nerves have been accidentally divided, or in which segments have been removed by operation. At the same time it is important, in judging the result of an operation, to bear in mind what may happen, in the way of restoration of function, without any operation whatever. If due allowance be made for the part which may be played by the natural regenerative power of nerves, and for the deceptive effects of the vicarious action of muscles and nerves, it may be hoped that a judicious application of the present resources of surgery will lead not only to a better understanding of the intricate problems of the morphology and physiology of the nerves, but also to the great advantage of those who have sustained injuries of the class described.

H HEREDITARY CHOREA.

THE hereditary transmission of disease, or of the tendency thereto, is nowhere better illustrated than in many nervous and muscular affections. We can recognize an entire group of so-called "family diseases," of which progressive muscular atrophy, pseudohypertrophic paralysis, and hereditary ataxia are the most striking examples.

A hereditary tendency to chorea is well recognized in children, but the remarkable record given by Dr. PERETTI, in the *Berliner klin. Wochenschrift*, No. 52, 1885, is probably unexampled in the history of the disease. Mrs. N. suffered from a mental affection and choreic movements, and there was a history of similar troubles in her parents and

grandparents. Two of her four children, Mrs. A. and Anton N., when adults, suffered for years with chorea, and the latter became insane. Of the five children of Mrs. A., three became choreic, one son has tremors, and one is insane; while of the ten children of Anton N., six developed chorea; so that, in all, twelve members of the family have been afflicted. The disease appeared in each case in middle life, after forty years of age, and has persisted. In several members of the family insanity followed, or came on at the same time with the development of the movements. The author regards the affection as true chorea of the chronic form described by Sée, which affects adults or elderly people, and persists for years without any relief from treatment. Peculiarities which separate this form from the common infantile disease are the diminution of the motion during intentional movements, and the chronic, incurable course; and it is not improbable that when the morbid anatomy of the disease is known, it will be found to be more closely allied to those disorders of coördination depending upon sclerotic changes in the brain than to true chorea.

This is doubtless the same affection as has been well described as hereditary chorea by Dr. CLARENCE KING in the *New York Medical Journal*, vol. i., 1885. In the family which he observed, the great grandmother of his patient had ten children, four of which were sufferers. Of three of these the history is incomplete, but they had children who developed chorea. Of the fourth child the history is well known. He had nine sons and daughters, only one of which was affected, and he has five children, of which three were choreic and two healthy. The disease never manifested itself before the twenty-fifth or thirtieth year—although it often appeared later—in one instance, not until the fiftieth year. In the *Medical and Surgical Reporter*, 1872, Dr. GEORGE HUNTINGDON, of Pomeroy, Ohio, gave an excellent account of hereditary chorea as it existed in certain families of the east end of Long Island. The late appearance and the tendency to mental disorders, together with the hereditary nature, are exceedingly well portrayed.

IS HE DEAD?

MOST of us remember the mythical dog of the distich, who, while he lived,

"Lived in clover,
And when he died, he died all over."

The dog was mythical, not on account of his habitat, but because no vertebrate is subject to the synchronous death of all its parts, except as a result of instant annihilation. Were we, however, to decapitate the living subject of the rhyme, there would be before us, after the last convulsive struggle, that

which to the layman is a dead dog and nothing more. We, of course, know that in that limp body there still lurk all the potential energies of life, and that were the vessels of the severed head filled with a stream of bright arterial blood, the drooping lids would rise to disclose eyes roving, perhaps, from point to point in search of the assailant. The stream is stopped, and once again the dog is dead. We open the abdomen and do not cause thereby the slightest twitch of pain. The heart has ceased to beat, and not the faintest gasp is heard or seen, and yet before our eyes there slowly writhes the warm and most uncanny gut. The opened belly cools, the movement dies away, but blood removed from the now well-filled veins still shows, when microscopically examined upon the warm stage, the amoeboid movements of its living leucocytes.

And even now there still remains intact one vital attribute. The muscles, lax and inert because deprived of those great central motor forces which were, perhaps, the first of all to fail, will yet respond to an electric stimulus. It was through a knowledge of this fact that ROSENTHAL was enabled to diagnose an apparent death of forty-four hours' duration and thus prevent a premature burial. RICHARDSON, of London, observes that unless the body be previously warmed, the test may fail.

Such methods were not at the disposal of our forefathers, and for them the cessation of respiration and circulation heralded inevitably the coming of the end. The former condition was determined by the mirror or feather at the mouth or nostrils, or by balancing a vessel of water on the seemingly motionless chest. That such signs are of value only when positive, is sufficiently shown by the fact that respiratory movements are not thus discernible in hibernating animals. Apart from the finger on the pulse, the heart's arrest and its attendant train of effects were shown by the unreddened tip of the tightly ligatured finger, by the non-oxidation of the bright needle inserted in the flesh, by the disappearance of the normal translucency of the hand, by the uncoagulable bubbly serum in the heat vesicle produced post-mortem, and by the absence of congestion on the subcutaneous injection of ammonia. There is, also, a series of neuro-muscular phenomena of much importance: the simultaneous relaxation of the sphincters, the dropping of the jaw, the flexion of the thumb against the palm, and the absence of pupillary response to light or atropia. Then came BOUCHUT's ophthalmoscopic observation of the development of gas in the retinal vein immediately after death—an observation of great importance if fully confirmed.

Until some thirty years ago, however, the symptom of muscular rigidity when coincident with other mortuary signs, meant but one thing. The *rigor*

mortis was the stiffness of death, and indicated not only that the individual was beyond recovery, but that the muscles themselves were dead, and their myosin coagulated by a demonstrable post-mortem development of acid. Then were published, almost simultaneously, the observations of BROWN-SÉQUARD and STANNIUS. The former, using as material two executed criminals, showed that in, respectively, thirteen and fifteen hours after death, the rigid limbs of these subjects, on the injection of arterial blood in their vessels, became lax and responsive to electric stimulation. The analogous experiments of Stannius demonstrated the apparent paradox of temporary artificial rigor mortis, induced in a limb by the exclusion therefrom of arterial blood for a space of from two to four hours, and dissipated by the reëtrance of the normal blood stream. KÜHNE, who repeated these experiments, and whose results have for some time been regarded as final and conclusive, maintained that here the rigor was incomplete, and that a more prolonged stoppage of the arterial current would have produced a rigidity which could in nowise be dissipated, and which was dependent upon the death and coagulation of all the muscle fibres of the limb.

But now there reach us the reports, fragmentary, unconfirmed, and lacking in detail, of a recent discovery made by BROWN-SÉQUARD, which appears to prove that *muscles in a state of cadaveric rigor remain endowed with the vital attribute of contractility up to the appearance of putrefaction*. By means of a delicate recording apparatus, the observer just mentioned has shown that from the time of appearance of rigor to the entrance of muscular putrefaction (a period of days and even weeks), there is an alternate contraction and relaxation, many times repeated, of the fibres involved. It is suggested by Brown-Séquard that the chemical changes which pave the way for putrefaction are the efficient stimuli of the contractions, which in some instances were measured, and were found to consist in a shortening of the muscle to less than two-thirds of its length in the relaxed state.

With the suggestion that daily microphonic observations of the muscles after death would probably throw decided light upon the subject, we must await with great interest the further data of a discovery, which, if confirmed, disproves the coagulation theory of rigor, and which most surprisingly postpones the period of actual death in one of the most important tissues of the body.

MUSCLE AND TENDON REACTIONS.

THE interesting observations of DRS. S. WEIR MITCHELL and J. MORRIS LEWIS, concluded in this number of THE NEWS, on certain tendon and muscle phenomena, are not only of value as positive addi-

tions to our physiological knowledge, but they seem also to contain the promise of a deeper insight than we yet possess into the laws governing muscular irritability in normal and pathological states. In a subject so well threshed out as this has been since Westphal's discovery, we could scarcely have expected to find so many novel points.

The authors agree with previous observers, that the knee-jerk, and other responses to tendon taps, are direct muscle acts, and a very considerable portion of the research consisted in a study of the various circumstances which increase or lessen these acts. The influence of volitional acts, already noted by Jendrassik, and the effects of strong galvanization of the brain in increasing the knee-jerk, are truly remarkable, while a combination seems capable of inducing in healthy individuals a sensitiveness of muscle such as is only met with in disease.

The passive tension, upon which Gowers and others lay such stress, is not thought to be essential, and they support their position by several striking observations. The tone and intrinsic irritability suffice, and by virtue of these, and not the passive tension, though this may assist, the muscles respond to various excitations. The study of the direct muscle reactions is very interesting, particularly in the relation established between them and the so-called reflexes. It seems odd, as the authors remark, that the electrical contractions of muscles are not reinforced by means which add to the knee-jerk and muscle reactions. We should certainly have expected a similar result.

The overflow theory which the authors adopt to explain the increase of the knee-jerk by voluntary acts, etc., seems to meet the case, but it is of secondary consideration in comparison with the value and suggestiveness of the facts worked out in this important research.

SOCIETY PROCEEDINGS.

NEW YORK NEUROLOGICAL SOCIETY.

Stated Meeting, February 2, 1886.

THE VICE-PRESIDENT, LEONARD WEBER, M.D.,
IN THE CHAIR.

DR. C. L. DANA reported a case of

TOTAL TRIGEMINAL PARALYSIS WITH ALTERNATE HEMIPLEGIA, AND THE RELATION OF THIS PARALYSIS TO THE SENSE OF TASTE.

The patient was a single man, aged thirty-five, under the treatment of Dr. George L. Fox, for eczema of the scalp. He had always been healthy, and gave no history of syphilis or excessive indulgence of any kind except in athletic sports. In August, 1885, he was attacked with a trigeminal paralysis on the left side, affecting all of the sensory branches of the fifth cranial nerve, and to some extent probably the motor branch. The paralysis

came on without any other complicating symptoms. In December, 1885, he was attacked with a crossed hemiplegia, affecting the right arm and leg, and the right side of the face. When seen by Dr. Dana in consultation, the paralysis was found to be not very complete, that of the face especially not being very marked. There were no sensory and only very temporary speech disturbances. There was complete anaesthesia in the distribution of the left trigeminus, but no loss of taste on either side of the tongue. The patient soon recovered in a considerable measure from his crossed hemiplegia, but the sensory paralysis remained unchanged. In Jan. 1886, the patient had an attack of left hemiplegia.

Dr. Dana discussed the question of the nerve of taste, and referred to the contradictory opinions at present held regarding it. Most authorities now believe that the glossopharyngeal gives power of gustation to the posterior third of the tongue, and that the fifth nerve similarly supplies the anterior two-thirds, sending fibres to it via Meckel's ganglion, the great superior petrosal, the seventh nerve, and the chorda tympani. Gowers has recently declared that the sense of taste is supplied by the fifth alone. The speaker presented a review of all the evidence so far collected, and came to the conclusion that the glossopharyngeal is probably the sole nerve of taste. In his own case the lesion was probably a small hemorrhage in the lower part of the pons.

DR. SAMUEL SEXTON said that ten years ago it was considered proper to divide the chorda tympani for tinnitus aurium, and it was supposed to have been done. This nerve has a long and circuitous course through the tympanic cavity, and is surrounded by a sheath of mucous membrane liable to inflammation in the acute purulent processes of the ear, especially in children. He had seen and studied a large number of cases in which, owing to acute purulent inflammations, there was complete destruction of the tympanic contents, including the chorda tympani; there was no alteration of the sense of taste, though the tests to discover such an alteration were carefully made. An Italian writer has called attention to the chorda tympani as a nerve in intimate connection with speech; that certain word sounds could not be found when it was absent. But Dr. Sexton's experience had not verified this. Taste is a complex function which is developed slowly by cultivation. When the tympanic membrane is absent, so that a probe can touch the inner wall of the tympanum, a variety of reflexes can be evoked, such as vomiting, coughing, sneezing; secretions, especially in the region of the tonsils and pharynx, are increased, as is also the saliva.

DR. M. A. STARR reported ten cases of total anaesthesia following neuralgia of the trigeminus in which there was no loss of taste. In his study of the lesions of the medulla and pons there was no record of loss of taste, though all of the cranial nerves, except the ninth and tenth, were involved; all of which would support the views advanced by the author of the paper.

DR. A. D. ROCKWELL had seen many cases, and instanced one in which there was neuralgia of the seventh and fifth pairs of nerves, accompanied with loss of taste.

DR. DANA, in closing the discussion, thought the cases cited by Dr. Sexton showed that the chorda tympani does not carry the nerve-fibres of taste at all; that they were proof that they must take another course from that described by most of the text-books. It hardly

seems probable that they have so complicated an arrangement as that claimed by Gowers, which he showed by means of a diagram.

VASOMOTOR NEUROSES.

DR. M. ALLEN STARR said that under this title he included a series of disturbances of circulation and nutrition, the causation of which could be traced to disorders of the nervous system. He selected this subject because it was one which had been somewhat neglected in the discussions of this Society, because no definite summary of the present state of knowledge of the physiology of the vasomotor action had lately been presented, and because he had recently seen a number of cases which might be classed together under this title, and which he wished to have discussed by the members present.

Disturbances of the circulation may occur in any part of the body, and are to be regarded, not as distinct diseases of the parts in which they occur, but as symptoms of lesions of the peripheral, or sympathetic, or central nervous systems. At the present time, however, it is impossible to make a pathological classification of these symptoms, and therefore they may be discussed together. In treating of the subject of vasomotor neuroses, the physiology and pathology of the vasomotor system can be discussed together with advantage.

Since changes in the force and frequency of the heart's action and variations in the total amount of the blood in the body affect the body as a whole, the state of the circulation in any one organ or part depends largely upon the degree of contraction or dilatation of its vessels. This is known as the local vascular tone. It is under the control of the system of nerve ganglia with their subservient fibres, which are found in the smaller arteries. The energy expended by these ganglia is manifested by a constant contraction of the circular muscular coat of the artery, a contraction which is constantly opposed by the dilating force exercised by the blood-pressure within the vessel. In a state of health an exact equipoise between these forces never occurs. Variations, however, in the vascular tone are produced either by local influence, or by influences reaching the ganglia from a distance through the vasoconstrictor or vasodilator fibres. The constant manifestation of energy in the maintenance of arterial tone does not have its only source in the local ganglia, but is derived partly from the central nervous system through the vasoconstrictor nerves. Here the experiments of Claude Bernard were detailed. From these experiments, it was concluded that a dilatation of the vessels follows: 1, a paralysis of the local ganglia in their walls; 2, separation of these from the sympathetic ganglia; 3, a destruction of the sympathetic ganglia; 4, a separation of these from the spinal cord by division of the anterior spinal nerve-roots; 5, a disintegration of the cord; 6, a separation of these centres from the medulla; 7, the destruction of the medulla oblongata.

The action, so far considered, has been wholly of a vasoconstrictor kind, and the dilatation mentioned has been due to a suspension of constrictor energy, normally passing outward. This is a passive dilatation. But further experiments have shown that another kind of dilatation may be produced, due to an impulse of an

active kind sent to the local ganglia by the vasodilators. This is an inhibitory impulse, arresting the constrictor action of the ganglia in the vessel walls, in spite of the continued energy sent them from the central nervous system by the constrictors. Here the experiments on vasomotor dilatation were given, and the various theories of the mechanism of dilatation in the vessel walls, it being concluded that there was no mechanism in the wall which could produce a dilatation, and that a dilatation was due wholly to the blood-pressure within overcoming constrictor action.

The subject of vasomotor reflexes was then taken up, and it was shown that the seat of these reflexes is in the dorsal region of the spinal cord, since all vasoconstrictors and vasodilators can be traced to that region. The particular area of the spinal cord governing these reflexes, was thought to be the gray matter surrounding the central canal, and including the fascicular columns of Clarke. As bearing on this point, the author referred to the observations by Jacobovski, Schultze, and Fürstner. It is impossible to say from these cases whether vasomotor functions are located in the column of Clarke or in the gray matter around the central canal, or in both.

Vascular tone of the thoracic and abdominal organs is regulated by centres in the pons and medulla. Experiments of Bernard were related, and cases of diabetes mellitus and diabetes insipidus produced by lesions of the medulla and pons were mentioned. The influence of the vasomotors in the production of functional disorders of the stomach and intestines was alluded to.

From this review of physiological experiments and pathological facts, it becomes evident that the disturbances of vascular tone, which are included under the title vasomotor neuroses, may be produced by many different causes acting upon many different organs. The author here mentioned a number of possible causes and their location, after which he gave the histories of seven cases of vasomotor neuroses with remarks on the same. These cases seemed to illustrate some of the conditions which have still to be classed under the term vasomotor neuroses, from want of a more perfect knowledge of their nature. They appear to be little noticed in the books, and rarely discussed in societies; but they certainly merit careful study, inasmuch as they require cautious and scientific treatment.

DR. SACHS thought that some statements made by Dr. Starr elucidate some obscure points in experiments which he made several years ago on animals, to discover the relation of the spinal cord to the secretion of the kidneys. Eckhardt had stated that section of the cervical spinal cord had the same effect as section of the medulla; that is, to inhibit the secretion. These experiments were difficult, because of the necessity of keeping up artificial respiration, but they showed that urine was secreted as in health, though somewhat diminished in quantity. That it was actually secreted, was proved by introducing chemical substances into the blood, the coloring matter of which was shown in the urine secreted. The results obtained by Eckhardt were probably due to peripheral irritation caused by laying bare the ureters, which interfered with the secretion of the kidneys. He asked Dr. Starr what views he advanced with reference to the course of the vasoconstrictor nerves.

DR. STARR replied that one theory is that they pass from the lateral tracts of the cord through the fourth, fifth, and sixth cervical, into the sympathetic system, and thence to the viscera. Another is that they enter the sympathetic as far down as the level of the first dorsal. There is an intimate connection with the kidney. Experiments high up in the cord would, of course, produce diabetes.

DR. SACHS said that in his experiments high up in cord there was no diabetes.

DR. C. L. DANA considered himself indebted to Dr. Starr for so able a paper. The local vasomotor ganglia had been assumed to exist, but had never been satisfactorily demonstrated as physiological entities. Vasomotor disturbances are common as symptoms, and are so considered rather than as a distinct disease. Accompanying them there are almost always marked sensory and trophic symptoms, especially if chronic and had made an effect on the system. In this class of cases are those vasomotor troubles of the extremities, such as *digiti mortui*, and mild types of renal disease; flushing of the ears, Basedow's disease, and diabetes, should also be ranked among these. It gives rise to confusion to consider the vasomotor system as independent, in the same way as the sympathetic system, forgetful of the relation of both of these to the cerebro-spinal.

DR. WEBER spoke of the connection of sciatica with diabetes. While sugar is found in the urine of patients suffering from protracted sciatica, there were few cases of well-developed diabetes in which there was sciatica. He related three cases of sciatica in which there had been sugar in the urine, and the attending symptoms of diabetes. He had seen cases where sugar was present *after* sciatica; but he was doubtful if cases of true diabetes were developed by sciatica.

DR. LESZYNSKY related two interesting cases of vasomotor disturbances. He questioned whether cold is not a factor to be considered, since a case of symmetrical gangrene under his observation had relapses on cold days. Chilblains are common in winter.

DR. STARR, in closing the discussion, remarked that the vasomotor local ganglia had been very recently demonstrated by French physiologists in frogs, rabbits, and cats. He did not intend to give the impression that sciatica caused glycosuria, but referred to those cases, quite a number of which were on record, where there was a sudden appearance of sugar in the urine which afterward disappeared.

CINCINNATI ACADEMY OF MEDICINE.

Stated Meeting, February 1, 1886.

THE PRESIDENT, SAMUEL NICKLES, M.D.,
IN THE CHAIR.

DR. PHILIP ZENNER, in introducing the subject

TUMORS OF THE BRAIN,

remarked that our present knowledge of cerebral localizations lends especial interest to the subject of cerebral lesions. This knowledge is, however, of least practical value in its application to neoplasms of the brain. This is the more to be regretted because of the probability that brain tumors will be soon relegated, in part at least,

to the domain of surgery. This inability to locate neoplasms is made more serious, and our operative treatment is made less hopeful, by the fact that a large tumor, or even multiple tumors, may remain, at least for a long time, latent, while a small tumor may produce symptoms; again, a small tumor of the brain may produce marked symptoms, while a large tumor in the same locality produces none; in other words, tumors in the same locality differ greatly in the symptoms they produce.

The features of a brain tumor which produce symptoms are: 1, its location; 2, its size; 3, character, density, vascularity, etc.; 4, the rapidity and manner of its growth; and 5, the extent to which it destroys or softens the brain substance. These various factors bear a certain relation to the kind of tumor. For instance, cysticerci are of soft consistence, and do not destroy the brain-substance; carcinomata and like hard tumors destroy the nervous tissues; so it may prove that certain tumors have their characteristic symptoms. But it is not now possible to make such an assertion.

Brain tumors produce symptoms in two ways: First, by causing general increase of the pressure within the cranial cavity; and, second, by the direct influence which they exert on the brain tissue in their immediate neighborhood. Tumors of the brain may destroy the nerve tissue; they may cause softening, or they may produce compression of the tissues in their locality. To produce local compression of the nervous tissues the growth must be harder than the tissue in which it lies. If it is softer, while it may produce heightened intracranial pressure, local symptoms are not produced. Thus, soft tumors of certain parts of the brain, as of the pons, have been found of a size which greatly increased its size, and yet in which no symptoms were produced which were referable to the pons. If a tumor be located in the cortical portion, the brain may gradually accommodate itself to the increasing pressure, and no symptoms will be produced; but in the base, direct pressure produces symptoms. Another reason for the production of symptoms in tumors of the base of the brain is the presence in that locality of large nerve-trunks, so that a very small area at the base corresponds to a very large one at the cortex. Furthermore, it appears that when a part of the cortex has been destroyed, another part may take on its function. The symptoms produced by these changes are either those arising from a loss of function or from irritation. It produces irritation when it is subject to constant changes in size, as when it is vascular in character, or when it causes inflammatory changes by its continued growth. Another mode is by the increase of intracranial pressure depending on the size of the tumor and the rapidity of its growth. There is increase of pressure in every part of the cranial cavity, but the increase in all parts is not precisely equal. The increase of intracranial pressure may thus produce symptoms which are ordinarily of local significance. Thus, the olfactory nerves may be compressed between the brain and the frontal bones. Loss of smell occurs independently of the locality of the tumor; and the third, sixth, or seventh nerve may be affected in the same way. The nerves may be compressed where they pass through the tense *dura mater*, or they may be compressed by the enlarged bloodvessels.

Such conditions are liable to be sources of error in

the localization of brain tumors. It is well, therefore, to remember this rule, that focal or localizing symptoms are the less valuable in making a local diagnosis the more marked are the symptoms of heightened intracranial pressure.

The most characteristic symptoms of heightened intracranial pressure are, headache, double optic neuritis, vomiting, changes in the pulse and in the mental condition. Headache is the most prominent, and is often of great severity, almost driving the patient wild. If the pain be quite circumscribed and be constantly in one place, it is likely to point to the seat of the tumor; this is especially true if there be tenderness over the circumscribed part. Usually, however, pain is of no value in localizing the tumor. There is one exception to this statement, however, that is of importance, and that is that a constant pain in the posterior part of the head and neck localizes the tumor, as a rule, in the posterior fossa of the skull. It is occasionally found that the headache and pain disappear when paralytic symptoms develop; probably this is because a part of the brain tissue has been destroyed and the pressure has been relieved. There are other cases in which pain is never manifest; these are chiefly tumors of very slow growth.

Convulsions may occur in tumors of any part of the brain. These convulsions can sometimes with difficulty be distinguished from epilepsy; they are often quite limited, however. Double optic neuritis is a common general symptom, and is believed the most nearly pathognomonic of brain tumors. It often is not noticeable unless specially sought for. It not infrequently affects the vision of one eye more than that of the other; but sometimes it causes total blindness. Blindness setting in early is of value in localizing the tumor. Vomiting indicates a tumor, in that it occurs independently of the condition of the stomach, whether that viscus be full or empty, and is often precipitate in character.

The chief localizing symptoms of brain tumor are, paralysis of the cranial nerves, hemiplegia, hemianæsthesia, monoplegia, partial spasms, reeling gait, aphasia, and hemiopia. Some of these symptoms may also be caused by the increased intracranial pressure regardless of the localization of the tumor. It may also be mentioned that in some parts of the brain tumors are latent. This is especially true of parts of the frontal lobes, the corpora striata, and optic thalami.

The diagnosis of the existence of brain tumors is based upon the presence of general symptoms, or upon the presence of gradually increasing focal symptoms. When an individual suffers from a constant headache that is not relieved by ordinary methods of treatment, he should be examined for a brain tumor. If, then, a double optic neuritis is discovered, it is an almost indubitable symptom of brain tumor.

Of the medical treatment of brain tumors I shall say little. Apart from opium as a narcotic, the iodide of potassium is the best drug. Given persistently in large doses, it is said to have produced cure in cases which were not of syphilitic nature. It is probable, however, that in the near future operative procedures will be employed, at least in a number of cases. An operation for brain tumor will be thought of chiefly in connection with lesions of the convexity.

Let us consider briefly what symptoms point us to a proper diagnosis. Tumors of the skull, which appear

externally, need no special mention. Headache is an important localizing symptom. When it remains constantly in a circumscribed part, especially if pain be produced by percussing the head at the same part, it points to the probable seat of the tumor; certain motor symptoms are of great value. Monoplegia—that is, a paralysis of one part of the body—if of central origin, is usually due to lesion of the cortex. Clonic spasms, especially when confined to one part, as to one side of the face, and in cases of more general spasm, the symptom is generally indicative of the presence of a tumor. But the symptoms do not always point to lesions of the cortex. When a monospasm occurs in a part previously paralyzed, a doubt can scarcely be entertained that the lesion is in the cortical portion, and that this lesion is a tumor. Hemiopia and aphasia are usually due to cortical lesion. Such are the symptoms which under very favorable auspices may point us to the diagnosis of tumors in the convexity; but we must not forget that the value of symptoms are in the inverse relation to the indications of increased intracranial pressure. In the foregoing we have had in view the removal of a tumor which could be thought of only when it occurs in an accessible part of the brain.

Wernicke has suggested another operative procedure in cases in which removal is not to be thought of—that is, tapping the ventricles in order to relieve the intracranial pressure. In some cases the increase of pressure is not sufficient to warrant this procedure, but in many cases it is considerable. Tumors in the posterior fossa of the skull usually cause a large accumulation of fluid in the ventricles.

One symptom is so common and so important in such cases that it must be spoken of at length. This symptom is blindness. The distended third ventricle presses downward on the optic chiasm and produces atrophy. These are the cases in which blindness appears early. Double optic neuritis rarely produces blindness, but when this occurs in this connection it is usually the result of complications, generally an atrophy of the nerve. This atrophy of the nerve is usually the result of a tumor in the posterior fossa of the skull, generally of the cerebellum. Therefore, blindness occurring early is of much importance, not only in a diagnostic sense, but also because, if tapping prove beneficial, it indicates the urgent necessity for immediate treatment.

In concluding his remarks, the speaker reported several cases of brain tumor which had come under his observation, in connection with which he made further remarks on the tapping of the ventricles.

DR. JAMES T. WHITTAKER remarked that although he had come with the intention of listening to the specialist, and not of speaking, he would venture to give the views of a general practitioner. Brain tumors, if he might judge from his own experience, are rare. From an experience of twenty years, he thought he could say that he had not seen enough to average more than one case each year. He had seen more cases of sclerosis than of any kind of brain tumor. Being rare, they have more of a scientific than a practical interest; and as the most interesting question connected with the scientific consideration of the subject refers to the cause of these growths, he had hoped to hear a fuller consideration of their causation this evening. This is all the

more interesting to us now, since the advance of the theory of Cohnheim, that all tumors are developed from embryonic tissue, and it would be interesting to know just what relation this kind of tissue bears to brain tumors.

Brain tumors frequently are the local expressions of a general condition. They are generally syphilitic, tubercular, carcinomatous, or sarcomatous, and we, therefore, have in the age of the patient alone an important indication of the character of the growth—tuberculosis in early life, syphilis in middle life, and carcinoma in later life; sarcoma being the carcinoma of youth. The speaker thought that he had made better hits in the diagnostication of brain tumors by judging from the age of the patient and the presence of some disease in another part of the body, than from any other feature of the case. Even a syphilitic tumor may usually be diagnosticated from the existence of some trace of the disease long after its more active manifestations have disappeared. Tuberculosis seldom occurs in the brain, except as basilar meningitis, without some manifestation of the disease elsewhere. So with carcinoma; it is rare to find it in the brain without its presence in some of the more frequent localities of its invasion. Dr. Zenner has given an admirable exposition of the symptomatology; and it is surprising to know how many new points have been added to the knowledge of this subject in the course of a year. The diagnosis of brain tumors has been repeatedly studied, and offers us now little difficulty, and the character of the growth does not offer much difficulty as a rule, but the point which is of most interest, the localization of the tumor, is still invested with great difficulty. Dr. Zenner has put in the foreground certain symptoms upon which especially we base the diagnosis of brain tumor. Chief among these is the character of the pain, and stress has been laid on the persistence of pain. A patient with persistent pain in the head, associated with some paretic manifestation, whether with difficulty of vision or not, and whether he denies or affirms the existence of trouble in his eyes, we send to an oculist. A choked disk in connection with these symptoms means nearly always tumor of the brain. The speaker had never yet failed to make a correct diagnosis of the character of a brain tumor where a choked disk was found in connection with headache and paralysis or paresis. The location or character of the pain, in his experience, localized the tumor rather as an exception and not as a rule. Once, where he had thought to localize a tumor in the anterior fossa of the skull, from the constant localized supra-orbital pain and tenderness, and where he had been later compelled to admit the existence of lesion in the posterior part, in the cerebellum, on account of the reeling gait, the post-mortem showed the presence of a tumor nowhere else than in the cerebellum.

The localization of brain tumors has, of course, its practical side as well as its scientific side; but the fact that a brain tumor has been cut out, although a brilliant triumph of diagnosis, would give him less hope than a pyrorectomy, because, as the speaker of the evening had said, the operation would be practicable only in those cases in which the tumor is located in the convexity. Of the tumors which have come under my observation, all have been localized deeper in the brain substance, and in the cerebellum for the most part.

Since, then, only a few tumors are situated in the cortical region, but very little hope could be afforded by an operation. The probability is that a carcinomatous tumor would return; that a tubercular tumor would be multiple; a syphilitic tumor would not require extirpation; and so we would have to confine ourselves to the sarcoma or glioma, and the glioma distinguishes itself by not being circumscribed. It shades off gradually into healthy brain substance, a large portion of which would have to be removed. Successful extirpation of tumors of the brain would not, therefore, offer even as much hope as extirpation of tumors of the pylorus. The case would be quite different if we could attack the tumor with the galvanocautery wire or needle, without exposing it; without removing a large amount of brain matter before the tumor is reached. In many cases in which the speaker had witnessed the removal of these growths upon the post-mortem table, a large amount of healthy brain substance had to be removed, as stated, in order to get at the tumor. Then, too, other tumors are firmly adherent to the brain; they are not encapsulated, so as to be peeled out like an orange.

He would not like to be understood as saying that brain tumors can be diagnosticated by the general condition of the patient, by the presence or absence, for instance, of syphilis, tuberculosis, or cancer elsewhere in the body. The truth is, brain tumors develop for the most part in individuals previously apparently healthy, and, with the exception of a few cases which follow traumata, seemingly without cause. But the recognition of a brain tumor calls for a search for these various diseases in recognition of its character. The speaker thinks that the choked disk is accounted for by the expression of the cerebral fluid between the sheaths of the optic nerve out to the retina. He is certain that this condition occurs very frequently without blindness, or without any marked disturbance of vision. Hence, it is in his opinion a much more valuable symptom than visual disturbance.

DR. C. W. TANGEMAN took exception to the views of the last speaker with reference to the possibility of locating brain tumors from the presence of a choked disk. He did not think the ophthalmoscope possessed as much value in the localization of intracranial diseases as is sometimes claimed. The exact method in which the double optic neuritis is produced is not fully understood. Von Gräfe has suggested the possibility of its being due to increased intracranial pressure, and several other views have been expressed by other authors since his publication, but not one of them is satisfactory. It has been shown that we may have a tumor of the brain the size of one's fist, greatly increasing the intracranial pressure, without any optic neuritis whatever. Cases are on record in which brain tumors have existed for nine years without producing any effect on the optic tract. Cases of total blindness have been reported following a tumor the size of a cherry, where the increase of intracranial pressure could have nothing to do with the optic symptoms. So far as localizing the tumor by the effects it produces is concerned, we are frequently misled, because the intracranial pressure may produce a meningitis from which a neuritis—a descending neuritis, as it is called—may follow, and mislead us entirely. The fact that we have optic neuritis, or that we have optic atrophy, does not always indicate that the symptoms

are due to brain trouble. If we have the general symptoms of brain tumor, associated with optic neuritis, we may be more certain in our diagnosis. As regards the relation of blindness to brain tumors, the speaker thought it the rule and not the exception, as stated by Dr. Zenner.

DR. JOSEPH RANSOHOFF remarked that the disposition on the part of neurologists to turn cases of brain tumors over to surgeons is anything but acceptable to the latter. The time has not yet arrived when these tumors can be operated upon successfully. The two cases of operative interference in brain tumors which were reported in England during the last eighteen months, and which, so far as the speaker knew, are the only ones on record, do not encourage others to pursue a similar course. Were it possible, which, as Dr. Zenner has shown us, it is not, always accurately to locate the cerebral neoplasm, operative measures would be feasible in only a small proportion of cases. In removing tumors elsewhere seated than on the convex cortex, insurmountable difficulties arise in the way of the operator. It is not impossible that in the near future, when greater accuracy in locating deep-seated neoplasms has been attained, electrolysis may be resorted to for the destruction of such growths as the knife cannot reach. In cystic tumors this would be particularly likely to be followed by good results.

His experience did not agree with that of Dr. Whitaker regarding the frequency of brain tumor. It was quite certain that he saw an average of one brain tumor *per annum*. The tumors which he saw were mostly located in the cerebellum, and in all of the cases the diagnosis was satisfactorily made from the vomiting, cerebral headache, reeling gait, and optic neuritis. The reeling gait and optic neuritis are, in the speaker's experience, so constantly present in cerebral neoplasms, that when these two symptoms are prominent in any case a strong suspicion of cerebellar tumor should be entertained. When a double optic neuritis supervenes, in addition to other symptoms, there can be no doubt as to the condition.

He regretted to learn from Dr. Zenner that so many complications depending on anatomical relations should exist to render more difficult the localization of a cerebral growth. He had hitherto taught that, with a fair knowledge of the course of fibres in the brain, such localization is easy. The rocks upon which a diagnosis may "go to pieces" having been pointed out by the essayist, the speaker will in the future be more careful of the manner in which he treats of the ease with which the situation of cerebral growths can be recognized.

DR. E. G. MITCHELL expressed his surprise at the statement that the diagnosis of cerebral tumors is easy. He had always thought that these growths are, above all others, difficult of recognition. The symptoms are certainly often vague and of doubtful value. He had seen a post-mortem in only one case of brain tumor, and in that the growth had not been suspected until recognized on the post-mortem table. No symptoms whatever had been produced that indicated its presence during life, although the growth was as large as a walnut and situated in the cerebellum.

DR. ZENNER, in closing the discussion, remarked that one condition, namely, a double optic neuritis, is of more importance than any one condition that can be

found in the diagnosis of brain tumor. It is said to occur in some other conditions, in certain of the acute infections, and in some kinds of chronic poisoning, etc., but it is of so frequent occurrence in tumors of the brain, as to be of the greatest importance in them. He would not hesitate a moment in the diagnosis of a case of persistent headache in which he found double optic neuritis. There are many cases, or at least some cases, no doubt, in which a brain tumor has existed for a long time without any symptoms whatever, but there are many of these same cases in which a tumor might have been discovered if it had been sought for. In more than half the cases in which it is sought it is found, but it is not always present. This symptom of a brain tumor sometimes appears and disappears. It is also sometimes accompanied by no perceptible impairment of vision. Förster finds some defect in the periphery of the field of vision in all cases in which there is double optic neuritis. We should attempt to find those symptoms which are easily recognized if suspected, but the difficulty is that we are not accustomed to look for these minute impairments of function. It is a rare thing to find double optic neuritis in itself leading to blindness, and blindness is of value in locating the tumor in the posterior part of the brain. Tumors that can be removed are rare, and it is rare that tumors of this character can be diagnosticated. Reasons have already been given why tumors at the convexity do not generally produce symptoms. With regard to the tapping of the ventricles, although there is no positive rule for its being resorted to, the speaker thought that it should be considered in all cases for the sake of palliating the symptoms. The question is whether we can prevent the occurrence of total blindness, the advance of the reeling gait, and the mental impairment, which sometimes are symptoms of the greatest importance in these cases. These patients sometimes live a long time; in one of the cases referred to by the speaker in his report, a patient had lived five years, possibly much longer, after he had become totally blind and deaf, but such prolonged existence was merely prolonged misery. If the operation would be of benefit, the patient might live all this time with his eyesight and his hearing. In another of his cases the sight and hearing have remained unimpaired for six months, and it is a question of great import whether or not these faculties can be retained.

With regard to the diagnosis of cysts, the speaker concluded that the cysticercus is more easily recognized than the echinococcus.

In answer to a question by Dr. Reamy, Dr. Zenner said that, of all the symptoms of brain tumor, double optic neuritis is the least valuable in helping to localize the growth. It throws no light whatever upon the seat of the tumor.

NEW YORK SURGICAL SOCIETY.

Stated Meeting, January 26, 1886.

THE PRESIDENT, CHARLES MCBURNEY, M.D.,
IN THE CHAIR.

OSTEOTOMY FOR ANGULAR DEFORMITY OF THE
HIP-JOINT.

DR. C. T. POORE presented a boy who had angular deformity of the hip-joint after long-continued disease; flexion ninety degrees, abduction forty-five degrees. In

June last, he performed a linear osteotomy just below the trochanter minor, and was able to correct the greater part of the flexion; but the abduction was difficult to correct, because the application of extension had a tendency to bring the pelvis down on the diseased side, and thus prevent the correction of the abduction, and, in order to compensate for this depression of the pelvis, the limb was crossed over the sound one. In October following he performed a second osteotomy, which left the boy in the condition seen. After the second section, an old sinus on the inner side of the hip broke out, but it was not connected with the bone, and was simply a breaking down of old cicatricial tissue. At the present time there is about eight degrees of abduction, and from twenty-five to thirty of flexion, but the boy is able to walk very well. The sections were made with an osteotome.

EXCISION OF THE SUPERIOR MAXILLA FOR CANCER.

DR. L. A. STIMSON presented a patient, forty-five years old, who was admitted to Bellevue Hospital, December 9th, with the history of the appearance four months previously of a small, painless swelling on the right side of the roof of the mouth adjoining the molar teeth. Shortly afterward, he noticed that the cheek adjoining the right nostril was prominent. Both enlargements have slowly increased, and two weeks before admission there was profuse epistaxis from the right nostril, repeated at intervals for several days. The tumor in the mouth was small, but slightly elevated, not fluctuating; that of the cheek was firm and uniform; it raised the nostril and extended alongside the nose, but to only a short distance outward or upward on the cheek.

The superior maxilla, exclusive of the orbital plate and the malar process, was removed through the incision under the eye and along the side of the nose, and the tumor was found to occupy entirely the cavity of the antrum, but was not adherent to the upper posterior or lateral wall. Recovery from the operation was uneventful.

A noticeable feature in the case is that the bone was involved only on the floor of the antrum and at its lower anterior and inner portion; that the tumor had spread downward and forward by invasion of the bone where it is comparatively thick, rather than in the more common direction, forward into the cheek at a higher point, where the wall of the antrum is thin.

CHOPART'S AMPUTATION.

DR. STIMSON presented a patient with the following history:

M. Q., thirty-two years of age, a laborer, was admitted to Bellevue Hospital, June 25, 1885. He said that in August, 1883, a heavy log of mahogany fell across his foot, crushing it badly, and producing a compound fracture of the tibia. When admitted there was fibrous ankylosis at the ankle-joint, and the patient walked on the ball of his foot, where an ulcer soon formed which was very troublesome. In 1884 the ulcer was treated in Bellevue Hospital, where he remained seven weeks, and then left with the ulcer healed. On admission in 1885 there was an ulcerating surface on the ball of the left foot through which bone could be felt. The surrounding tissues were very red and greatly swollen. On September 15, 1885, the patient was

etherized and an unsuccessful attempt was made to break up the adhesions in the joint. On October 19th, Chopart's amputation was performed under antiseptic precautions. The highest temperature reached after the operation was 100.6° F. The wound healed throughout without suppuration.

On November 18th the dressings were removed, and the patient was allowed to go about. The patient now has a useful stump, and the scar is well above and in front, out of the way of pressure, and he walks squarely upon the heel. Dr. Stimson stitched the anterior tendons down, notwithstanding the fact that the joint was so stiff that it was believed to be impossible for it to allow the heel to turn up.

THE PRESIDENT asked, with regard to the second case, whether Dr. Stimson made any special effort to cut the anterior tendons long.

DR. STIMSON replied that he did not take any special precautions because of the stiffness of the ankle-joint.

PATELLA SUTURED WITH CATGUT.

DR. L. A. STIMSON presented a patella which illustrated the fact that catgut is strong enough to hold fragments of fractured patella in position for a sufficient length of time to allow of their complete union. In the course of an operation for extirpation of the knee-joint, he had occasion to divide the patella, which was united with catgut. The wound was closed, and union took place without suppuration. The operation was performed August 28, and in the subsequent December he excised the knee-joint, because of the continuation of the disease, and removed the patella presented, which had been divided longitudinally, so that the character of the union might be distinctly seen. He thought it was practically impossible to recognize the line of division. He was unable to say whether he used two or only one catgut suture. There was nothing in the specimen which answered that question, and, unfortunately, that point was not noted in the history of the case.

CLINICAL SOCIETY OF MARYLAND.

Stated Meeting, January 8, 1886.

DR. FRANK WEST reported a case of

SUCCESSFUL LAPAROTOMY FOR INTESTINAL OBSTRUCTION.

DR. RANDOLPH WINSLOW also reported a case of
INTESTINAL OBSTRUCTION SUCCESSFULLY TREATED BY
LAPAROTOMY,

which will appear in full in the next number of *The American Journal of the Medical Sciences*.

The two cases were discussed together.

DR. L. McLANE TIFFANY thought the Society should congratulate itself on having two such successful operations reported on the same night by two of its members. These are, so far as he is aware, the first recoveries from this operation in this part of the country.

DR. W. T. COUNCILMAN readily appreciated the difficulties that a surgeon encounters in doing this operation. It frequently becomes necessary for him, even in making autopsies on patients who have died as a result of intestinal obstruction, to remove the contents of the abdominal cavity *en masse*, before the exact point and nature of the obstruction can be made out.

DR. J. EDWIN MICHAEL said it was the appreciation of just such difficulties as referred to by Dr. Councilman, that caused in Winslow's case the opening of the inguinal canal. It was impossible to say that the irreducible tumor in the groin played no part in the obstruction until its condition was investigated by operation and only when it was found to contain fluid and no intestine, was the obstruction sought elsewhere. He thought the great amount of manipulation necessary in Dr. Winslow's case made it a less favorable one for recovery than Dr. West's. A comparison of the two cases was very favorable to the claims of antiseptic surgery. In the worse case of the two, strict antiseptic precautions were taken, and a rapid uneventful recovery followed; while in the other case, in which less exposure and manipulation of the intestines were required to overcome the obstruction, there was more or less trouble. He was not of the opinion that the chill that occurred on the eighth day in Dr. West's case was of septic origin.

DR. WEST said that he thought Dr. Michael's criticism of his case was very correct, and that if he had the operation to do over again he would observe all antiseptic precautions.

DR. S. T. EARLE asked whether the cæcum was distended in Dr. Winslow's case.

DR. WINSLOW said, in reply to Dr. Earle's question, that he felt for the cæcum, and then passed his hand over the large intestine without discovering anything abnormal, but owing to the distended condition of the small intestine, which filled all available space, that was not to be wondered at. The cæcum was, however, collapsed, as was proved subsequently after the constriction had been overcome. It is not easy by the sense of touch alone to distinguish the different portions of the intestines, a fact which is strongly emphasized by a recent English writer.

DR. JOHN CHAMBERS said, in comparing the two cases reported, that he could not see that Dr. Winslow's case, performed under rigid antiseptic precautions, had any advantage over Dr. West's case, done with but little regard to the details of antiseptic surgery. He would just as readily operate without such precautions as with them.

In operating for hernia, he said, the abdominal cavity is practically opened, and up to a few years ago no one ever thought of using any special antiseptic methods in this operation. He said our most successful operators in abdominal surgery are not strict antisepticians.

DR. W. T. COUNCILMAN asked Dr. West whether, at the time he operated, there was any existing peritonitis.

DR. WEST said that when he opened the abdominal cavity the peritoneal coat of the intestines was very red. He took it to be an inflammatory condition. No lymph or serum was present.

DR. WM. P. CHUNN knew of two cases that he thought could have been saved had laparotomy been performed. He asked why Dr. Winslow had not enlarged his abdominal incision instead of making an opening over the inguinal canal. Would it not have been easier to sew up the abdominal wound with one single set of sutures going through the whole thickness of the walls, than to make two sets, one for the peritoneum and one for the skin and muscles? He has used the single suture in five successful cases of laparotomy and has never had

any pus get into the peritoneal cavity. When he sews up the wound with this single suture, it is his custom to hold a flat sponge beneath the incision to catch all escaping blood, and thus prevent its entrance into the abdominal cavity while the needle is being passed. This is impossible when Dr. Winslow's plan is adopted.

DR. WINSLOW, in answer to Dr. Chunn, said that he made a small incision at first, because he hoped to be able to relieve the trouble without incurring the increased risk of a long incision. He used the form of suture employed, because it is certainly desirable to separate the peritoneal cavity from the wound, and sometimes when the skin incision fails to unite the peritoneum will hold, and thus prevent the access of germs to the peritoneal cavity. The only change he would make in the manner of closing the wound would be that instead of passing sutures entirely through the abdominal walls, as was done in this case, he would unite the peritoneum separately with continuous catgut sutures, and then pass the deep sutures through all the tissues external to the peritoneum. In this way the danger of pus passing backward into the peritoneal cavity would be remarkably diminished. He did not operate upon the supposed hernia first, and subsequently open the abdomen, because there was absolutely no evidence of strangulation; after opening the abdomen a condition of affairs was found which, in his opinion, demanded herniotomy, though it was by no means certain in the mind of the operator and of his chief assistant that they had to deal with an incarceration of the gut. When no intestine was found in the sac, he was assured that the constriction was elsewhere. Whilst an error in diagnosis to this extent was made, it did not in any way complicate the case, but, on the contrary, resulted in a cure of the sac, whatever the nature of it may have been. Dr. Chambers is in error in supposing the case of Dr. West to have been more desperate on account of the peritonitis which was present at the time of operation. In neither of the cases was there any lymph or effusion from the intestines, hence, though both were deeply congested, peritonitis had not set in either. The statement that both cases terminated favorably, and, therefore, the rigid antiseptics of the one had no advantage over the less stringent precautions of the other, and that the good result in both was entirely independent of the use of antiseptics, is scarcely borne out by the facts. It certainly would seem that the maxim "*tuto, cito ac jucunde*" was as applicable here as elsewhere. It is a mistake to say that our best operators discard antiseptics. If by "our" is meant American, it is undoubtedly an error. Homans, of Boston, and Battey, of Georgia, are the most successful American operators, and they are rigid antisepticians. Keith, who is, probably, the most successful operator in the world, likewise employs antiseptics.

There has been much written of late upon the treatment of intestinal obstruction, and there is considerable diversity of opinion in regard to it. Mr. Hutchinson, one of the best practical surgeons in England, is opposed to operative treatment until all other means have failed. He advocates abdominal taxis, which consists essentially in a series of rough manipulations of the abdomen, shaking the patient, inverting him, tossing him in a blanket, etc., with large enemata, the internal use of opium and belladonna, and anæsthesia. If this does

not succeed, he waits, puts the patient on low diet, and repeats the taxis. Treves and others advocate early operation, as soon as it is clearly established that the case is one of obstruction. Iloway, of Cincinnati, advocates the use of enemata under strong pressure. The method of abdominal taxis is dangerous, and is likely to cause rupture of the bowel or loosening of an intussusception, or increase of the hernia instead of reducing it. Enemata, under strong mechanical pressure, are also dangerous. Abdominal section offers the best chances for success, if simple means fail. Sometimes the constriction is a simple band, which can be easily divided, as in a case seen by the speaker, where the band was only as thick as a few strands of horsehair, or, as reported by an English surgeon, where the vermiform appendix constricted the ileum.

Dr. Winslow, in conclusion, said that three symptoms are sufficient indication for the operation—obstinate constipation, severe intestinal pain (especially when the coils of intestine can be seen and felt through the abdominal parietes), and stercoraceous vomiting.

DR. N. G. KEIRLE had, some years since, had a patient, aged eighty-five, who had marked stercoraceous vomiting and swelling in the femoral region. He cut down upon the swelling, and found a sac with nothing in it. He suggested opening the abdomen, but as his consultant did not agree with him, the idea was abandoned. He asked whether Dr. Winslow was sure his case was not one of intussusception?

DR. WINSLOW was sure it was not.

DR. L. McLANE TIFFANY did not think there was any peritonitis in Dr. West's case, as there was no exudation either of lymph or serum. He thought the redness of the peritoneum due to congestion. He called attention to a phenomenon that he had often observed in twenty-seven cases of strangulated hernia upon which he had operated, and of which he had notes: if vomiting prior to the operation was present, then vomiting took place during or immediately after reduction. It had occurred in both cases reported to-night. He thought it had relation to relief, and considered it a favorable prognostic sign. It may or may not be accidental; however, he considered it worthy of consideration. Where obstruction is complicated with femoral or inguinal hernia, washing out the stomach has reduced it, and vomiting after reduction may be a reversed action and not evidence of strangulation. If inverting the patient does not liberate the knuckle of intestine, he thought it better surgery to open the abdomen than to cut wildly over the veins.

He had not operated upon a single case of strangulated femoral hernia in which the patient did not complain of pain in the region of the umbilicus, and regarded this as an important point in diagnosis. A marked hyperæmia of a limited portion of the intestine often gives rise to symptoms closely simulating those of obstruction. He thinks the persistent vomiting, after reduction of a hernia, due to a localized hyperæmia and an atony of the gut at the point of constriction. Did not think Dr. West's case should be cited as one that recovered without antiseptic precautions. In his opinion, sufficient antiseptic detail was observed, and he looked upon the comparison between the two cases as not being altogether a fair one, as the conditions were far from similar. He did not think the chill on the eighth

day in Dr. West's case was the result of septic poisoning, but was probably malarial.

DR. S. T. EARLE said he did not think that one should be content with finding but a single obstruction. Others should at least be sought, for a case had recently been recorded in which the patient died from a second obstruction that had existed at the time the first one was reduced.

DR. J. EDWIN MICHAEL said, in regard to the remarks made by Dr. Chambers which were opposed to the importance of antiseptics in surgery, that it is usually recognized at present by surgeons that unless you have especially adapted apartments in which to operate, it is essential to the success of the operation, and is due your patient that every precaution should be observed.

Dr. Chambers has gone far astray in saying that most of our abdominal surgeons do not use antiseptic precautions, and especially in including Keith in that category. Keith has given up the spray, but as I am credibly informed by one who has recently seen him operate, he uses the most rigid antiseptic precautions in all other respects. It is true that Tait has had wonderful success with simple cleanliness, but it must be remembered that he operates in a private hospital where every detail of cleanliness is managed with scrupulous care. He avoids the causes of septic troubles in a way not practicable in a general hospital or private house. In regard to the unfairness of a comparison of the cases referred to by the President, I have only to say that the more they are compared the more apparent is it that Dr. Winslow's presented the most unfavorable features, and in regard to the sufficiency of antiseptic precautions, I can only refer to the candid admission of Dr. West, that in his case the antiseptic preparation was very incomplete.

DR. J. W. CHAMBERS did not think statistics would show any advantage for strict antiseptic surgery.

DR. N. G. KEIRLE thinks the operation should be done early, before inflammatory softening has begun; if not, one incurs the risk of rupturing the gut during manipulation.

THE PHILADELPHIA NEUROLOGICAL SOCIETY.

Stated Meeting, January 26, 1886.

DR. JOHN H. MUSSER presented some

NOTES ON THIRTEEN CASES OF TUBERCULAR MENINGITIS.

(See page 205.)

DR. WILLIAM OSLER then read a paper on

THE STRUCTURE OF CERTAIN GLIOMATA.

He desired to call attention to the histological character of certain brain tumors which present peculiarities of structure separating them from the ordinary small-celled gliomata.

The specimens which he showed were from three cases, the features, clinical and anatomical, of which may be thus summarized:

Case I.—Girl aged sixteen, blind from third year; intelligent; head not large. Occasional convulsions and spasms of muscles of neck. Death sudden. Tumor occupied the surface of the left thalamus, and extended

into the third ventricle. There was extensive dilatation of the lateral ventricles.

Case II.—Girl aged fifteen. Jacksonian epilepsy for over fourteen years. Small firm tumor occupied the upper part of ascending convolution.

Case III.—Man aged forty. Head pain, mental disturbance, drowsiness, the chief symptoms. Tumor, the size of a lemon, occupied the left anterior lobe of brain. The physical characters of these three tumors differed considerably. In Case I. the mass on the thalamus was firm, but the portion projecting into the third ventricle was soft, grayish in color, and looked like an actively growing neoplasm. In Case II. the small tumor at the upper part of ascending frontal convolution resembled a patch of sclerosis, while in Case III. the tumor had a large central area of fibro-caseous change with a peripheral zone of actively growing grayish-red tissue.

Histologically these tumors are similar in the dense feltwork of fibres which make up the chief mass of each, the fibres varying somewhat in thickness and in closeness of arrangement. Careful observation of teased specimens shows that the fibres are, for the most part, in connection with cells, and so far the growths conform to the type of glioma. True, we do not find here the typical arrangement of small cells with delicate protoplasm and numerous fine ramifying processes which gives to many gliomata an appearance not unlike that of a small-celled sarcoma. There are gliomata, however, with larger and more irregular cells and with coarser fibres than the description in text-books would lead us to suppose, and it was more particularly to certain characters in the cells of these tumors that he wished to call attention. A study of teased, fresh specimens can alone give a clear idea of the shape, size, and relations of the cell elements.

The following varieties of cells occur in these growths:

1. The ordinary "spinnen" or spider cell, with many processes, and which may be regarded as the characteristic cell of the glioma. These present considerable variety in size; many are not larger than colorless blood-corpuscles, others double or treble the size. The smaller have more delicate processes which in sections of hardened specimens may not be apparent. Some of the larger cells look not unlike multipolar nerve cells.

2. Large, unbranched, spindle-shaped cells, with greatly elongated processes. These resemble enormous connective tissue corpuscles, and the processes may be traced until they taper to extremely fine fibrils. Others are scarcely spindle-shaped, but present flat, ribbon-like processes. Some of these cells are among the largest and most remarkable met with in tumors. In Case I. the mass in the third ventricle was composed largely of them, and isolated ones measured as much as 0.4130 of a millimetre. They present usually single large nuclei, and the protoplasm of the cell is either homogeneous or finely granular. In Case III. these forms were also very abundant, but, in Case II. they were not numerous.

3. Cells which resemble closely in appearance large ganglion cells of the nerve centres. They present a dark granular protoplasm, large nuclei, and one, two, or more processes, which either run singly or finally branch. The most remarkable looking are those with a single process springing from a balloon-shaped cell.

Others have a process from either end of the cell body. They are usually much larger than the spider cells.

4. In Cases I. and III. there were structures of very curious aspect, which probably may be regarded as derivatives of the large fusiform corpuscles. These were remarkably translucent, band-like fibres, tapering slightly at either end, but without nucleus or granular protoplasm. From their close resemblance in form to the spindle-shaped cells, and from the fact that these latter often present a remarkable translucency, I think we may regard these peculiar fibres as resulting from a vitreous or hyaline transformation of the large spindle cells.

These tumors conform to the variety described as neuro-glioma by Klebs, who holds that the large ganglion-like cells found as such important constituents of these growths are derived directly from the nerve cells of the gray matter, and that in the development of this variety all the elements of the nerve tissue participate. Certainly the resemblance between many of the large cells and nerve elements is very striking, but I have not been able to satisfy myself of their relation to the preëxisting tissue parts. This is, of course, extremely difficult, but in a careful study of sections taken from the advancing regions of the growths, I have not met with appearances which would lead me to suppose that the nerve cells were in process of proliferation. Klebs states that he has demonstrated by means of osmic acid and gold chloride the nature of the cells and their processes, but this has not been confirmed, and I could not determine that the cells or fibres described above behaved in a characteristic manner with these reagents. That they are probably connective tissue elements seems probable from an examination of a large number of the cells in teased preparations. Gradations and intermediate forms can be seen between cells closely resembling unipolar or bipolar nerve ganglia and the typical spider cells with innumerable processes. Gliomata of this form are not uncommon. Klebs described fourteen or fifteen, and of five cerebral tumors of the glioma type which I have met with, only two were of the small-celled variety.

DR. WHARTON SINKLER reported

A CASE OF BRAIN TUMOR.

Miss S., æt. fifty-two. Mother, maternal grandfather, great-grandfather, two maternal uncles, and two brothers died of phthisis. Paternal ancestors long-lived. No cancer. Healthy and well up to four years old. Then had a serious illness, spoken of by some as "brain fever," another person says dysentery. Seemed to recover entirely from this and was bright, well, and agreeable. Was not very intelligent, but not by any means deficient. Catamenia first appeared at eighteen years. At seventeen years friends noticed a change in her, she was irritable, cross, and peculiar about many things. This condition of things continued through the remainder of her life, all the peculiarities becoming intensified. She was a great reader and a great eater. She was fond of literary pursuits and spent a considerable amount of time in writing and painstaking composition. She never had convulsions so far as was known. At twenty-five years she was examined as to her mental condition by Dr. Wm. Kirkbride, and he decided that, although not mentally vigorous, she was not insane.

For five or six years before her death, say at forty-five years of age, she seemed to grow stouter, less inclined to work, and in walking seemed to move slowly and with difficulty. For three or four years before her death there was a drooping of the left corner of her mouth, most noticeable in smiling or speaking. This gradually increased. For eight or ten years she has had headaches.

In the summer of 1885 she was at Atlantic City and had two or three attacks of violent headache associated with unconsciousness. These lasted several days at a time. She came under my charge in September, 1885. She then showed slight left facial paralysis, but no loss of power in arm or leg of either side. She complained sometimes of pain in the head, sometimes in the shoulder or neck. Seldom seemed to have persistent pain in one place. She had an attack of unconsciousness with severe headache. Screamed with pain, but could check herself, and when asked what was the matter, said she had pain, but could not state exactly where it was. At times she talked incoherently and spoke of having seen persons whom I knew she had never seen. She was unwilling to leave her bed, but if she could be persuaded to get up, could walk about. Her appetite was good, but there were indigestion and constipation. No vomiting. Vision seemed good, but the eye ground was not examined. She was eccentric in her way of talking, and said many things with the evident intention of creating surprise.

At my suggestion, she was taken to a country town in the vicinity of Philadelphia and was there under the care of Dr. J. Reeve. After reaching this place she complained of pain in the right side of the head and seemed unable to walk. Would fall into a semi-unconscious condition which would last for some hours. The temperature became elevated. The facial paralysis became more marked, but although no paralysis of the limbs existed there was general muscular weakness. The patient died on October 26, 1885.

The post-mortem examination was made by Dr. H. R. Wharton. Brain and cranial cavity: upon exposing the membranes of the brain they were found markedly congested, and the dura mater was very adherent to the petrous portion of the temporal bone on the right side. Brain removed, membranes divided and turned aside. Upon left side there was no apparent lesion. On the right side some bulging of the membranes was apparent in the region of the fissure of Sylvius, and upon dissecting them off they were found very adherent to a tumor larger than an English walnut, growing from the fissure of Sylvius about the line of the fissure of Rolando. The tumor was deep red in color, stood out from the brain tissue, and was dense to the touch. There was some effusion into the ventricles.

Dr. de Schweinitz made a microscopic examination of the growth and sent me the following report:

"The small portion sent for examination was hardened first in a solution composed of Müller's fluid one part, and methylic spirit three parts, for six weeks, and then in alcohol. Sections were cut, stained with carmine, and mounted in balsam. In the periphery the growth shows a structure composed of more or less perfectly developed fibrous tissue, more interiorly the stroma of the tumor is made up of numerous, variously sized, dilated bloodvessels, sometimes empty, but for the most

part filled with corpuscles. Between these are numerous small round and large spindle cells (sarcoma tissue); scattered through the growth, sometimes singly, often in groups, there are round, yellowish-white bodies, which are probably amyloid in their nature. The tumor may be properly classed as an *angio-sarcoma*."

The growth, as may be seen, is spherical in shape and springs up out of the fissure of Sylvius. The points of interest in the case to me are these. First, the probable long standing of the growth. It is likely that it began at the age of eighteen years, when mental peculiarities first showed themselves. Secondly, the absence of most of the symptoms peculiar to brain tumor. There were no convulsions, no vomiting, no defects of vision, and no pain localized in one particular spot. The facial paralysis was not noticed until three or four years before death. There were many marked hysterical symptoms which masked the true nature of the disease. These, I think, are often met with in brain tumors in women.

The following report was made by the Committee appointed to inquire into the

METHODS OF SLAUGHTERING CATTLE,

and the question as to whether cattle suffer from witnessing the slaughtering of companions.

Your Committee have the honor to report that they held a meeting at the Philadelphia Abattoir, and witnessed the slaughter of a number of cattle. As the arrangement of the building and the methods employed have been fully described to the Society in the paper of Dr. Hinsdale, it does not seem necessary for your Committee again to go over this ground; and the Committee confine their report to answering the questions proposed by the Society for the Prevention of Cruelty to Animals. We find, in the first place, that, owing to the unskilfulness in the use of the hammer by the butchers, that perhaps in the majority, certainly in a very large proportion of the cases, the animal is not rendered permanently unconscious by the first blow. In a number of instances the creature, when struck, either failed to fall, or simply went down upon his knees and rose again, and had to be driven around the pen, and sometimes struck again and again before falling. Further, it is the habit of the place to strike down several bullocks one after the other, so that one or two of the animals must lie on the ground some time before the throat is cut. In very many instances the creature seems partially to recover its senses during this time, and in some cases undoubtedly becomes perfectly conscious and even gets up upon his feet. There can be no doubt, therefore, that a large amount of unnecessary suffering is produced in the killing as practised at the Philadelphia Abattoir.

A properly directed and sufficiently powerful blow undoubtedly will immediately put an end to consciousness. It is not the general idea of the method of killing which is at fault at our abattoir so much as the unskilful way in which it is performed. If the animal were driven into a narrow pen, so as to insure quiet and a perfect opportunity for a blow; and if, at the same time, the hammer were heavier than the one now used, and were only employed by a skilful person, nothing more could be desired. In our opinion, there should be one man whose sole duty it is to strike down the

animals, since only by repetition can perfect skill be acquired.

We believe that there is a certain amount of psychical suffering induced by the present method. The animals evidently have a sense of danger, although they apparently do not recognize the point from which the danger is coming. The need for the appointment of some one who shall inspect the carcasses of the slaughtered animals was very well shown by the fact that, in one of the beasts killed during our stay, the liver was full of hardened nodules of a whitish color, and many of the lymphatic glands were evidently affected with the same disease. So far as gross appearances could determine, the animal, when killed, was in the advanced stages of tubercular disease of the liver. The nodules have been referred for examination to well-known microscopists, whose report we hope to hand in accompanying our own.

After the reading of the report of the Committee, on motion it was accepted, and the Committee were requested to present the matter, on behalf of the Neurological Society, to the College of Physicians of Philadelphia.

NEWS ITEMS.

PASTEUR ON THE SYMPTOMS OF RABIES.—A young man who was bitten two days ago by a dog immediately took it to the Veterinary School at Alfort to have it examined; but, as the animal did not appear to be affected with rabies, it was returned to the owner—a proceeding, in my opinion, rather strange, for certainly the animal should have been kept under observation at least for some days. The young man, however, being naturally anxious about himself, wrote to M. Pasteur, asking him to appoint an hour to receive him. The illustrious *savant* immediately replied by letter, and, as it is rather instructive, I give it here in its entirety: "It is useless for you to come. Every mad dog, whether it eats or not, dies from rabies in a few days; if it eats, death takes place a little more slowly, but it never exceeds eight or ten days. In the interval it manifests rabic symptoms. Confine the dog to his kennel, where he must be fed with precaution for at least twelve days. This had better be done under the supervision of a veterinary surgeon. If the dog lives after the time indicated, you may be assured that it is not mad. Meanwhile you have nothing else to care about than the wound caused by the bite. This should not be neglected. The saliva of a dog, even that of a healthy one, contains microbes foreign to the rabic virus, as those microbes might produce abscesses, and, in certain exceptional cases, septicæmia. In case the dog should go mad, come to me without delay, 45, Rue d'Ulm, at 11 A. M., where I will apply the preservative treatment for rabies."—*The Lancet*, January 23, 1886.

THE OHIO STATE SANITARY ASSOCIATION will hold its Third Annual Meeting in Columbus on February 24th and 25th. The President is Prof. Edward Orton, LL.D., of Columbus, and the Secretary, Dr. R. Harvey Reed, of Mansfield.

NEW YORK POLYCLINIC.—The report of the Secretary at the annual meeting of the Directors and Faculty of

the New York Polyclinic, held at the College building on January 28, 1886, showed an attendance upon the clinics in that institution since the opening in November 7, 1882, of 709 physicians. Of this number, 156 had taken out the general ticket which admits the holder to the lectures in all the departments taught at the school.

The ratio of attendance upon the various departments is shown in the following list of tickets sold since November, 1882, up to January 28, 1886: Gynecology, 461; Surgery, 412; Medicine, 313; Throat, Nose, and Ear, 300; Children, 273; Eye, 250; Skin, 234; Mind and Nervous System, 207; Physiological Chemistry, 73; Obstetrics, 163; Pathology (laboratory only recently opened), 15. Total, 2702. The attendance for the present session is in excess of any previous term.

BRITISH GYNECOLOGICAL SOCIETY.—MR. LAWSON TAIT has been elected President of the British Gynecological Society.

M. PASTEUR has just received from the Count de Laubespini the sum of 40,000 francs, in order that he may extend his operations for the prophylaxis of hydrophobia.

THE JOURNAL OF NERVOUS AND MENTAL DISEASES.—Dr. Morton has terminated his connection with the *Journal of Mental and Nervous Diseases*, which will hereafter be issued monthly, under the sole editorship of Dr. B. Sachs.

A CANADIAN VIEW OF THE CONGRESS OUTLOOK.—The *Canada Medical and Surgical Journal*, in an editorial in its issue of this month, says: "In our last issue we published gladly a letter from Dr. Brodie, of Detroit, whose opinions on the subject of the International Medical Congress are doubtless shared by a considerable section of the profession in America, but, in spite of his communication, we still adhere to the position taken by us in December. We then said that, to attract the workers of other countries, the Sections of the Congress must be controlled by the men most eminent in their respective departments, and we maintained that the officers so far nominated did not, with a few exceptions, rise above respectable mediocrity. In the spirit of the 'Declaration of Independence,' we agree with Dr. Brodie that the gentlemen in question are 'the peers of any member of the profession in the United States,' but the Congress is a *scientific organization*, and the executive and Sections have, heretofore, been composed of the best minds of the country in which it has met. What we maintain is that many of the Sections, as at present organized, are controlled by men who, evidently, have not the confidence of the scientific workers in the United States, and are unknown abroad. At present, the prospect is that the *peers* of the men who organized the London Congress will be absent from the Washington meeting—the men who, in the United States, occupy positions in the medical world corresponding to those held by Gull, Jenner, Wilks, Erichsen, Paget, Fraser, Flower, and others who made the gathering of 1881 so brilliant. As well may we suppose that the British profession could have made that meeting the success it was without men of this stamp as that the American profession can do without the coöperation of such men as Agnew, Bigelow, Ham-

ilton, Da Costa, Pepper, Mitchell, Loomis, Bowditch, Billings, Dalton, Martin, Leidy, Lusk, Thomas, Barker, Jacobi, Wood, Bartholow, and others who remain irreconcilable. Bombast and bluster will not cover up the disagreeable truth which is quite evident to outsiders, if not to Dr. Brodie, that, unless the present executive of the Congress patch up this unseemly quarrel, the meeting of next year is doomed to failure. The recent attempts to effect a compromise do not appear to have been successful, and we can assure Dr. Brodie that, if matters remain as they are, 'the most perfect and elaborate arrangements' will avail but little to attract foreigners in the absence from the Sections of such a number of the men who have made American medicine and surgery what it is to-day. We sincerely trust that at the next meeting of the American Medical Association steps may be taken to secure the needful harmony, without which, we repeat, it would be better to abandon the Congress."

THE NEUROLOGICAL SOCIETY OF LONDON has just been formed, with Dr. Hughlings-Jackson as President, and Dr. Wilks and Sir James Crichton Browne as Vice-Presidents. It is intended to include in the programme of the Society not only neuro-physiology and pathology, but also that aspect of neurology which bears upon psychology, both normal and morbid.

NEGRO AND CAUCASIAN DEATH-RATES.—The report of the Registrar of Vital Statistics of Selma, Alabama, in some remarks appended to a very full tabular statement of the causes of death in that city for the year 1885, presents the following interesting statistics in regard to the death-rates of the two races:

White births are in excess of deaths, 32. *Deaths among colored over births, 32.* Rate of births, 3 per 1000 in favor of the whites. Rate of deaths, 13 per 1000 less for whites.

Deaths from consumption nearly four times greater among the blacks; meningitis double; pneumonia shows the same rate as the whites. Deaths from Bright's disease double in the black race that of the white; cardiac disease double; rheumatism four times as fatal in black race; diphtheria three times as fatal in whites; malarial fever, 8 deaths among the blacks to 2 whites. There was an epidemic of cerebro-spinal meningitis during the winter and spring which greatly increased the deaths during this period. The deaths and births for the year were the same. The evident disproportion between the black birth- and death-rate is due to the fact that many births are not reported. Still, the birth-rate of the blacks is nearly equal to the whites. Were the returns perfect, the ratio of births would be in favor of the blacks. According to this statement, the excess of deaths per 1000 over the births in the black race is 7.7. The excess of births in the white race over deaths is 7.9 per 1000.

MORPHINE VERSUS HANGING.—DR. F. H. GERRISH advocates the hypodermatic administration of morphine instead of hanging as a means of inflicting capital punishment, claiming as advantages for this mode of punishment the following: (1) Its certainty; (2) Its painlessness; (3) Its freedom from the chance of horrible displays; (4) The reduction of dramatic element to a minimum; (5) Its inexpensiveness.—*Physician and Surgeon*, January, 1886.

ANTHROPOLOGICAL MUSEUM.—A project has been started in Berlin to establish there an anthropological museum, which will do with regard to the races of men what zoological gardens do with regard to animals. In the exhibition or garden, it is intended that representatives of various races shall permanently reside; while of such races as cannot stand the cold of the climate, representatives will be brought to Germany to reside there during the summer. An ethnological museum is to be established in connection with the exhibition, which is said to have the support of several capitalists.—*Lancet*, Jan. 30, 1886.

NOISELESS COAL FIRES IN THE SICK-ROOM.—Several lecturers on nursing have recommended that the coals for sick-room fires be enclosed in small white paper bags before they are brought in. To this suggestion a recent writer adds the useful corollary, that a thick layer of fine ashes should be allowed to remain under the fireplace. Most people dislike the appearance of a dirty hearth; but easily disturbed patients much appreciate the difference between a noisy and a noiseless fire—a reason why a gas and asbestos fire in a sick-room is preferred. For sick-room purposes the coal should not be of a bituminous, gasey, or flaring kind.—*Lancet*, Jan. 30, 1886.

A NEW METHOD OF SHOWING THE ACTION OF THE AURICULO-VENTRICULAR VALVES was shown at the last session of the Berlin Physiological Society, by DR. GAD. A'canula with a flat glass cover was inserted in each of the auricles of an ox heart, the cavities being illuminated by a minute electric lamp, which permitted the observation of the valves and chords, as influenced by varying pressures of water within the ventricles.

OFFICIAL LIST OF CHANGES IN THE MEDICAL CORPS OF THE NAVY, FOR THE WEEK ENDING FEBRUARY 13, 1886.

CRAWFORD, M. H., *Past Assistant Surgeon*.—Detached from the "Shenandoah" on the 8th instant to await orders.

RUSH, C. W., *Assistant Surgeon*.—Detached from the "New Hampshire" on the 15th instant, and ordered to U. S. R. S. "Franklin."

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF OFFICERS SERVING IN THE MEDICAL DEPARTMENT, U. S. ARMY, FROM FEBRUARY 9 TO FEBRUARY 15, 1886.

TILTON, HENRY A., *Major and Surgeon*.—(Fort Wayne, Mich.) Granted leave of absence for two months, to commence on or about March 1, 1886.—*S. O. 8, Div. Atlantic*, February 9, 1886.

SHANNON, WM. C., *Captain and Assistant Surgeon*.—Ordered for duty at Fort Warren, Mass., relieving Assistant Surgeon John M. Banister, who will return to his proper station, Fort Adams, R. I.—*S. O. 27, Dept. East*, February 6, 1886.

EDIE, GUY L., *First Lieutenant and Assistant Surgeon*.—Ordered for field duty in New Mexico with troop "K" 8th Cavalry.—*S. O. 23, Div. Missouri*, February 8, 1886.

THE MEDICAL NEWS will be pleased to receive early intelligence of local events of general medical interest, or of matters which it is desirable to bring to the notice of the profession.

Local papers containing reports or news items should be marked. Letters, whether written for publication or private information, must be authenticated by the names and addresses of their writers—of course, not necessarily for publication.

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